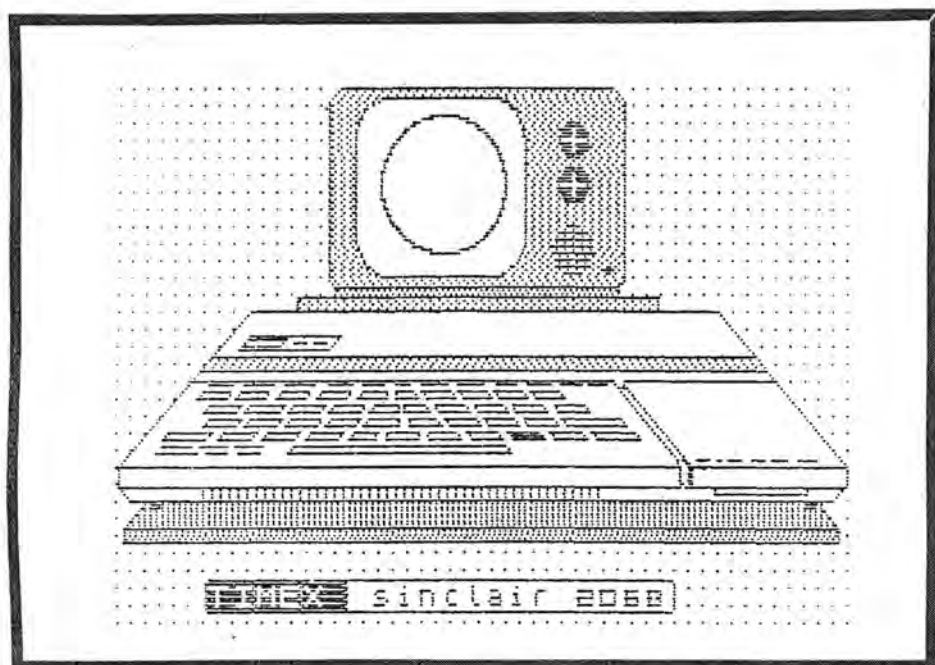


# TS Horizons



## ETCH-AH!-SKETCH

A Drawing Program for the 2068  
by Richard Watts

2068    1000

Computer Security  
Screen Scroll  
Greeting Card Designer

More on Keyboards  
Partial Pascal  
ZX Disk Drives

239 16-27

Rod Humphreys  
2006 Highview Pl  
Port Moody, B.C.,

V3H IN5

BULK RATE  
U.S. Postage Paid  
ASHLAND, KY  
PERMIT NO. 90

Postal Patron Local

# POWERFUL AND INEXPENSIVE BUSINESS SOFTWARE FOR ZX81, T/S1000 and T/S1500 COMPUTERS

## ZX-TEXT



## ZX-CALC



## ZX-CALENDAR



A word processor is to a computer user what a typewriter is to a typist, except that the former has more advantages than the latter. ZX-Text can operate in 16-64K RAM providing from 1300 to 6500 words per document. It features 6 different options: write, read, edit, print, save and clear text. Text is written on a per-line basis with quick speed and with horizontal back-space and delete capabilities being available. You can also access the editor directly from write mode and vice-versa. Text can be proof-read on a per-line basis allowing for enough time to determine if any editing is needed. The text editor allows a line of text to be deleted, inserted, replaced and listed for editing. You may also change a word or expression within a line, stop or start text while it is scrolling up the screen, begin reading text from the first line of the file, re-enter write mode from the editor, return to the main-menu or create a window so that you can read-edit two files simultaneously. The print option takes text displayed in 30-column format on the screen and outputs to either the ZX/TS printer (With Memotech's Centronics Parallel Interface 80-column and lower/higher - case output is possible) Files may be saved on tape cassette with the use of one single command, or by the same token they can be erased from memory / storage so that the full capacity of the program can be used for other purposes such as composing letters, reports, articles, memos, standard forms, instructions, ads, graphs, telephone directory, lists of customers, members, friends, etc. Also copies of files are always less expensive and easier to run than using a photocopier. Other advantages are savings in time, paper, ink, correcting mistakes and adding afterthoughts more efficiently than doing them through either handwriting or using a typewriter.

\$16.95

An electronic spreadsheet calculator is the fundamental basic tool for summarising, reporting and analyzing in matrix form any accounting, mathematical or scientific manipulation of numbers. ZX-Calc operates in 32-64K RAM and allows a maximum of 3360 characters / spreadsheet. The entire matrix consists of 15 columns (letters A-O) and 30 rows (numbers 1-30) with 8 characters / cell. Unlike other popular ESCs, ZX-Calc uses in calculations and within cells all 14 math functions on the ZX-81/T/S1000. It offers a unique "SUM" function that totals one or more rows / columns simultaneously. Parenthesis can be used within equations. There is no fixed limit on how many equations may be entered. Formulas may be stored in all 420 cells of the spreadsheet. The display affords 15 rows / columns. Loading of data into more than one cell can occur across / down one or more row / column simultaneously. With vertical windowing you can arrange a set of columns in any order, or practice using fixed-variable-alignment display formats. The menu offers 6 options: enter / erase, move, calculate, print, save and clear the spreadsheet. Enter / erase allows the entering, deletion or data alignment within a cell through the use of a mobile cursor. With the move option you may move around the entire spreadsheet to access any row, column or cell. The calculate option allows you to enter labels, values or formulas into a cell or write and enter equations that will act upon the data already within the spreadsheet. You can also enter bar graphs into a cell in this option. Absolute / relative replication, down / across a column / row, is also allowed by this option. Also this option allows the automatic calculation of the entire spreadsheet with one single command. Print allows you to output to either the ZX/TS printer the entire spreadsheet by column-sets and row-pages through use of the COPY command. The entire spreadsheet may be saved on cassette tape or you may clear all data from it or erase the program from RAM entirely. The most salient advantage provided by an ESC over specifically vertical applications software is that an ESC provides a reusable framework with which you can compose any specific financial model rather than just be limited to only one statically fixed format for storing, displaying and manipulating numerical data.

\$16.95

\$3.00 SHIPPING AND HANDLING / PROGRAM

Time management is an important aspect of any serious business and personal agenda. Planning how to spend our time leaves us better prepared before and while we are spending it and we remain better organized after we finish spending it. ZX-Calendar operates in 16-64K RAM affording 25 appointments in 16K, 100 in 32K or 180 in 48K and 64K. Each appointment record holds a maximum of 220 characters. The main menu includes enter, search/check/sort, change, save, clear and print any and all appointments made on a specific date or with any party. Output to either the ZX/TS printer is permissible. This program will permit you to remember to do something or to be somewhere important by cataloging your answers to six questions that you must account for in order not to waste time when it is scarce: when, with whom, at what time, for how long, where and what are you going to discuss and conclude when you get together with someone else? The program lets you permanently originate, record, classify, search, sort, calculate, modify, summarize, obtain a written report and store your answers to the preceding questions so that you will not forget what you decide to do with your time. This program identifies your time according to when you are going to spend it and with whom you are going to share it. Through these forms of labeling appointments you are able to verify or modify how your time is budgeted without wasting ink, paper or more time trying to remember what you said to yourself or what someone else said to you or where you placed certain written messages that you now can't find. With this program you will know where you can find exactly what you need to know about where you want to and have to be, or where you have been, before you get and after you get there. Thus, ZX-Calendar will let you plan your time so that you will never have to worry about what is ahead or what came before, for you will always know, by using it, to never be caught astray by any time-frame.

\$16.95

**A.F.R. SOFTWARE - 1605 Pennsylvania Avenue, No. 204 - Miami Beach, Florida 33139**  
DEALER INQUIRIES WELCOME (305) 531-6464 FLORIDIANS ADD SALES TAX

# TS HORIZONS

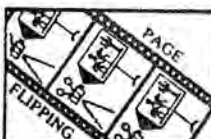
|                                     |    |                                     |    |
|-------------------------------------|----|-------------------------------------|----|
| ENTER                               | 4  |                                     |    |
| Try These                           | 5  |                                     |    |
| Alpha Strings-Letters               | 6  |                                     |    |
| Computers for Convicts              | 7  |                                     |    |
| Leave my Stuff Alone (2068)         | 8  |                                     |    |
| by William Pedersen                 |    |                                     |    |
| Making 2068 Back Ups on the         | 9  |                                     |    |
| A&J Mikrodrive - by E.A.Brown       |    |                                     |    |
| Etch-Ah-Sketch (2068)               | 10 |                                     |    |
| by Richard Watts                    |    |                                     |    |
| Right-to-Left Pixel-by-Pixel Screen | 13 |                                     |    |
| Scroll (2068) by Dick Scoville      |    |                                     |    |
| Filler Up (1000) by W. Coleman      | 14 |                                     |    |
| Textwriter 1000 Enhancements        | 15 |                                     |    |
| by John Ezike                       |    |                                     |    |
| Surplus Keyboard Improvements       | 16 |                                     |    |
| For Extra Shifted Keys (1000)       |    |                                     |    |
| by Walter Komlosy                   |    |                                     |    |
|                                     |    | ZX 81 News and Resources            | 18 |
|                                     |    | by Peter McMullin                   |    |
|                                     |    | Part-Way Down the Road With Partial | 22 |
|                                     |    | Pascal, by Tex Faucette             |    |
|                                     |    | Reviews for the NonProgrammer       | 23 |
|                                     |    | by A. Gindin                        |    |
|                                     |    | Greeting Card Designer (2068)       | 24 |
|                                     |    | Rev. by Bill Ferrebee               |    |
|                                     |    | Soft-Aid, Reviewed by Tex           | 26 |
|                                     |    | The "Horace" Saga (2068)            | 27 |
|                                     |    | by Doug Gangl                       |    |
|                                     |    | TS News                             | 29 |
|                                     |    | Classified Ads                      | 29 |
|                                     |    | Computer Terms - Humor              | 30 |



**#1 Nov '83 Creating/Saving Files** (Johnson), Repeat Key and Uninterruptible Power Supply Projects, Numerical Analysis, Load/Save Problems, Reviews, and more!



**#2 Dec '83 Matrix/Cursor Input** (Johnson), User-Friendliness, Reset Switch Project, Memory Reduction, Rule of 78, ZX Cash Register, Graphics Tutorial, etc!



**#3 Jan/Feb '84 Two Animation Programs**, Simple Loading Aid Proj. (Young), Tape File Protection, Differential Equations, Ham Radio Reviews, User Group News & More!



**#4 March '84 The Death of TCC**, TS1000 Bank Switching (Hunter), Error Recovery (Johnson), Edge Connector Schem., Simpson Rule, Reviews, Reader Input, & more!



**#5 April/May '84 "WORM" Word Processor** (Young) Pt.1, Least Squares, TS1000 Graphics Program, TS2068 Future?, Bank Switching Pt. 2, Program Tips, Reviews, and more!

**#11 Jan '85 - 40 Pages**, Lower Case on the TS 1000, 2068 Word Processor Eval.-Pt.1, Bar Graph, Experimenting with Byte Back Modem, Bank Switching-7, INDEX of issues 1 to 10, Reviews, and more.

**#12 Feb/Mar '85 - 2068 Mass Storage**, Software from England, Program Tips for TS1000, 2068 W.P. Eval.-Pt.2, Bank Switching Concluded, HTERM Patches, 2068 Tutorial, Programs.

**#13 April '84 - Complete 2068 W.P.** listing, TS1000 Simulated READ-DATA Worm Enhancements, User Defined Graphics for 2068, "Try These", Changing "Fonts"-2068, Reviews.

**#14 May/June '85 Special HARDWARE** Issue, TS1000 Keyboard Add-on, ZX81 Rampacks on the 2068, Surge Suppressor Project, User Group Report, W.P. Eval. Concluded, QL Report, Cassette Tips.

## BACK ISSUES



**#6 June '84 Ts1000 As Church Aid**, Interfacing Books, Num. Analysis, Hardware Tips, "WORM"-2, Switching-3, Good News from EA Brown, Six Reviews, and more!



**#7 July/Aug '84, Telecommunications** Issue, 2068 Program Tips, How A Compiler Works, Rotating Globe, Byte-Back Modem, TC for Beginner, Switching-4, WORM-3, S.I.N., etc.



**#8 Sept '84 TS 1000 Music Program**, 2068 Plotter, 2068 Character Set (Young), Address Program, Nine Reviews, Telecommunications Column, TS News, and more!



**#9 Oct/Nov '84 - ANNIVERSARY ISSUE**, TS 2068 Spirograph, Dave Higgenbottom interview, FORTH for T/S Computers, Spectrum section, Bank Switching-5, Telecommunications, Reviews, etc.



**#10 Dec '84 - 40 PAGES**, Making Backups of 2068 Software, Banner Programs, GL, TS1000 Program Tips, Christmas program, RS1000vs.TS1000, MTermII/Horizon Awards, Switching-6, TSUGs, New Column, more!

|                                         |       |       |       |
|-----------------------------------------|-------|-------|-------|
| — 12-issue subscription \$15 (in US)    |       |       |       |
| \$21 Canada, \$25 Other Foreign \$_____ |       |       |       |
| — Back issues @ \$1.50 each \$_____     |       |       |       |
| — #1                                    | — #2  | — #3  | — #4  |
| — #5                                    | — #6  | — #7  | — #8  |
| — #9                                    | — #10 | — #11 | — #12 |
| — #13                                   | — #14 | — #15 | — #16 |
| — #17                                   |       |       |       |
| Total enclosed \$_____                  |       |       |       |

### Subscription / Back Issue Order Form

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State Zip \_\_\_\_\_

SEND TO: TS HORIZONS, 2002 Summit St.  
Portsmouth Oh 45662

NOTE: RATE CHANGE effective April 30, 1986.  
New rate will be \$15 for NINE issues.  
\$21 Canada. \$28 Foreign. Back issues \$2.00 ea.



Dear Readers,

The excitement continues to mount as the First Annual Timex/Sinclair Computer Fest comes closer to reality. Just over a month from now hundreds, if not over a thousand Timex and Sinclair computer users will be meeting in Cincinnati for two days of learning, sharing, and working together. From the point of view of the planning committee for the event, it has met all of our expectations at this point: enough funds have come in to pay for the room and other expenses incurred. One interesting aspect of the Computer Fest is that if there is any surplus of funds after the Fest is over (and it appears there may be), the money will be saved for future T/S Conventions. This can be to help start an event in another area, or for a repeat of the Cincinnati Fest. The board will strive to see that the excess funds are used wisely. Eventually if the money is not used it will either be distributed to various user groups or perhaps given to a worthy charity. At any rate the money will not just be going to line somebody's pockets.

I have personally heard from people as far away as Kansas City and Iowa who will be attending the Fest. Reservations have been made for people coming in from Atlanta GA, Annandale VA, Decatur GA, Pittsburg PA, and Toronto, Ontario.

Some of the companies who will be represented there are:

Zebra Systems, Aerco, E Arthur Brown, Knighted Computers, Budget Robotics, RMG Enterprises, Budget Computer Services, Russell Electronics, Curry Computer, Ham Helper, Sync Ware News, JRC Software, DAMCO Enterprises and of course TS

Horizons. If you have ever wanted to meet some of these people this may be your only chance.

User groups who will be represented are: Cleveland, Columbus, Cincinnati, Dayton, and Milwaukee.

The Schedule of Events has yet to be finalized but we already have some very well-known speakers lined up. Mark Fendrick, columnist for Computer Shopper will be speaking on Timex Word Processing. Jerry Champkis will be discussing CP/M for Timex computers. Jack Roberts of TS Connection will be speaking on basic computer literacy. And I'm not sure that it is definite yet, there is a good chance that Tom Woods, author of the Pro-File programs will be discussing filing programs. Other planned events include sessions on telecommunications, machine language, music programs, disk and tape drives, the QL, and Forth. Other events that should be very informative are three planned round table discussions: one each for the ZX/TS family and the 2068 family and one to discuss general issues of concern to TS consumers, such as national unity and future prospects for the Timex community.

Another aspect of the Computer Fest is the planned swap session. Also valuable door prizes will be given away. While several people on the committee for this event have been very active, I believe two of these people deserve special credit. One is the very modest Jack Roberts and the other is Frank Davis who conceived the idea to begin with.

If you would like more information about

## Clive Alive?



On a recent trip to England my mother ran into one of my favorite Englishmen. It was Sir Clive Sinclair sitting and enjoying his favorite show on his pocket telly.

Actually this photo was taken by my mother at Madame Tussaud's Wax Museum on Marylebone Rd in London. The museum was started in the 18th Century and contains very realistic representations of such people as Humprey Bogart, Jack the Ripper, the Beatles, Ronald Reagan, and - Boy George.

this event write to:  
Midwest T/S Computer Fest  
3832 Watterson St.  
Cincinnati, Oh 45227.

Registration is \$5 per person and \$8 per family. Hope to see you there.

#### RENEWAL RATE EXTENSION

Mostly because I haven't gotten around to sending out new ad copy to magazines like Computer Trader that print subscription ads for TS Horizons, we are extending the deadline for subscribing at our current rates to April 30. After that date our subscription rate for new and renewal subscriptions will be \$15 for 9 issues instead of the current \$15 for 12 issues.

#### FREE CLASSIFIED ADVERTISING FOR SUBSCRIBERS

Beginning with this issue of TS Horizons we will be running FREE classified ads for subscribers. These ads are for individuals (i.e., non-commercial) to get rid of unwanted equipment, obtain used equipment, find help from other readers, form user groups or whatever. Please feel free

to send in as many as you want (within reason) and we'll get them in as soon as possible.

Well I guess that does it for another issue. By the way if you think the advertising in this issue is pretty sparse you're right. If you don't like it you, the reader, are the one who can do something about it.

Whenever you buy something from someone that advertises in TS Horizons tell that you saw their ad here. That is a great help to companies that are trying to decide how best to spend their advertising funds. Perhaps I don't emphasize that enough, but it is important.

See you in six weeks. Sincerely,

Rick Duncan

P.S. If you are in a user group that publishes a newsletter, make sure to read "COMPUTERS FOR CONVICTS" in the letter section. Thanks.

| Cover Date        | Issue No. | Ad Deadline |
|-------------------|-----------|-------------|
| May/June          | 19        | May 2       |
| July              | 20        | June 13     |
| August            | 21        | July 25     |
| September/October | 22        | September 5 |
| November          | 23        | October 17  |
| December          | 24        | November 14 |

## try these

The EXPANDING Text Line - by Peter McMullin  
ZX81/TS1000/TS 2068 2K or more)

After having gotten my feet wet writing some software, it became a challenge to represent introductory or instructive text sequences in an interesting way

I spotted the cover screen for an IBM software package which was a real eyecatcher: each line of text appeared to scroll outwards into place from the centre of the screen. The Sinclair BASIC string handling features lend themselves well to this sort of thing.

"A trivial routine like this must (and this one does) fill 3 requirements: 1) Executes quickly enough to achieve a specific effect. 2) Easily coded in BASIC. 3) Uses very few bytes.

"If you use the subroutine in a long Basic program, put it near the start of the program, where it will execute more quickly. The listing should be self-explanatory - the text input string A\$ must not be longer than 32 characters. An additional benefit is that the routine centres all text on the screen.

"Can you see why line 1000 is necessary? If not, delete line 1000 then run and see what happens with odd length strings. Here's the listing, have some fun!"

```
10 LET LINE=2
20 PRINT "> ENTER A TEXT STRING <32 CHR$ "
30 INPUT A$
40 IF LEN A$>32 THEN LET A$=A$( TO 32)
50 GOSUB 1000
60 LET LINE=LINE+2*(LINE<20)
70 GOTO 50
1000 IF LEN A$/2<>INT (LEN A$/2) THEN LET A$=A$+" "
1010 LET END=LEN A$
1020 LET MID=END/2
1030 FOR N=1 TO MID
1040 PRINT AT LINE,16-N;A$( TO N)+A$(END+1-N TO )
1050 NEXT N
1060 RETURN
```

# ALPHA STRINGS

## LABEL MAKER MODIFICATION

Dear Mistern Duncan:

Thank you for the February/March issue and your renewed commitment to TS Horizons. I have very much enjoyed your magazine and look forward to continuing to receive it even if it's somewhat less frequently. So keep it coming.

Bill Ferrebee's program "Label Maker", that appeared in your February/March issue and, I think, every other TS magazine I receive, is a handy program. But many printers do not respond to LPRINT TAB and some readers may have difficulty getting the program to work right. The enclosed listing shows my modification that works with the Aerco interface and the Olivette PR 2300 Printer. Maybe it can help some other reader to utilize this fine program.

Thank you again for a very good magazine in the past and in the future.

Sincerely, T. L. McCorkle, Monticello, IL

*Thank you for the program modification. It is printed elsewhere in this section. R.D.*

## LITTLE GOODIES REVISITED

Dear Rick:

I tried some of those goodies by George Mockridge that you printed in the middle of [issue 17] and some of them worked pretty good. Some of them need a little more explanation on how to use them. Some of the things appear to be usable only with the TS 2040 printer. If I entered OPEN\*2 as a BASIC line the computer would not enter it. I recalled that I had come across an article of a similar nature. After a search I found it in SYNTAX of April 1984, page \*3. That article showed it had to be entered as OPEN\*2,"P". Entering it that way enabled it to work. The computer would allow no other punctuation mark for entry other than the comma. The SYNTAX article showed "P" for printer, "S" for screen, and "K" for the bottom of the screen. The "copy screen without using the COPY" command would work on an 80-column printer but would not limit itself to 32 columns. The way I got around that was to place an LPRINT after the NEXT X. I also found I could indent the whole copy by placing LPRINT TAB 8; after the FOR I=0 TO 21 statement.

James Brezina, Elmhurst, IL

*Thank you, James, for that clarification. For*

*more information on OPEN\* and CLOSE\* see Doug Gangi's article in TSH no. 12, page 19. R.D.*

Dear Sir,

Your "Little Goodies" for the 2068 was great. I hope we can get more important information like this. I don't understand the vertical line in \*13 and \*14. It doesn't seem to make sense as the variable i.

Keep up the fine work.

Cordially, Byron DeFries, Bonduel, WI

*I can certainly understand why \*13 and \*14 didn't make sense to you and several other readers. Actually the vertical lines in both instances should have been the upward-pointing arrows that are used to indicate exponents in 2068 BASIC. (This arrow is identical to the double asterisk(\*\*) on the TS 1000 and some other computers.) In Mr. Mockridge's original article they were correct. Also we made additional mistake in \*13, which should read:*

(13) LET x = INT (x \* 10↑y + .5) / 10↑y  
*Number 14 is correct if the lines are replaced with arrows. Here is an example which may help to clarify the use of this routine. In conventional algebraic notation, the above equation would read:*

$$x_r = \text{INT} (x * 10^y + .5) / 10^y$$

*where  $x_r$  is the rounded number. Substituting 3.14159 for x and 3 for y (i.e., three decimal places):*

$$x_r = \text{INT} (3.14159 * 10^3 + .5) / 10^3$$

$$x_r = \text{INT} (3141.59 + .5) / 1000$$

$$x_r = \text{INT} (3142.09) / 1000 = 3142 / 1000$$

$$x_r = 3.142$$

*So there you have it. This is a handy routine for many financial programs, for example, to round off to dollars and cents. NOTE: Negative values of y can be used, say -3 to round off to the nearest thousand. R.D.*

*One more clarification is in order while we are on the subject. In "goodie" \*17 ("Gives line feed to print statement") the punctuation following PRINT is three apostrophes. This command causes the computer to print one blank line for each apostrophe: 3 blank lines in this case. The same technique works for LPRINT - only the blank lines are printed on the 2040 printer. R.D.*

## USERGROUPS

Dear Rick,

I live in an area that is devoid of a User's Group. That is it was till last Christmas-New Years holidays and I put an ad in the paper. Now we have a User's Group, four people including myself. Our third meeting



is coming up March 23. Last meeting two members worked on a machine code program for the 2068. Just listening I am picking up a little. It is hard to learn when some simple thing is not clear and it takes months to find an answer. Now I have several friends to call up and ask.

Sincerely, Donald Lambert, Cedar Rapids IA

*Dear Donald, as your experience proves even a small group of people can create a very successful user group. Some of the most active TS user groups have only a handful of members.*

*TS Horizons is starting a couple of new services that perhaps can help user groups like yours. First if you are interested in contacting other Timex users in your area we can provide you with the names and addresses of our subscribers who live within the Zip Codes you request.*

*Secondly, with this issue TS Horizons is starting a free service to our subscribers. FREE classified ads. The classified section will be a great place to attract interest in your user group. See this issue's ENTER section for details. R.D.*

## "COMPUTERS FOR CONVICTS" DEPARTMENT

No, this is not some sort of tacky April Fool's joke. A California user group made a gift of two Timex computers (a 1000 and a 1500) and some software to some inmates in a Nevada prison. Currently ten inmates are taking turns with the two computers and a computer literacy course that was also donated.

The January '86 issue of *Timelines* contained a letter from one of the inmates. To quote a small part of it: "When I came into prison over a decade ago, there were no such things as microcomputers and user groups, or nice folks who would share such a wonderful thing... This is something I have wanted to learn for so many years, but have been unable to, because of the rigid financial restrictions imposed by a prison setting... You can believe that the gracious gift you supplied to us is being used to the fullest extent."

George Mockridge is the president of the Peninsula User Group (263 Gateway, No. 107, Pacifica Ca 94044). He and his user group have been co-ordinating this effort and he brought it to our attention here at TS Horizons. George has asked user groups to provide free newsletter subscriptions to the men. In his words "Imagine how much it would mean to these computer beginners to receive 5 to 10 newsletters from around the country dealing with their new and sometimes confusing T/S endeavors."

The address to send newsletters to is:

Robert Kelly #12415,  
P.O. Box 208-SDCC, Indian Springs NV 89070.

Their TSH subscription begins with this issue.

TSH

```
10 CLS : INPUT "Program Title:";a$
12 IF LEN a$>32 THEN GO TO 10
14 PRINT TAB 16-(LEN a$/2);a$
20 INPUT "Line #2 Info:";b$
22 IF LEN b$>32 THEN GO TO 20
24 PRINT TAB 16-(LEN b$/2);b$
30 INPUT "Line #3 Info:";c$
32 IF LEN c$>32 THEN GO TO 30
34 PRINT TAB 16-(LEN c$/2);c$
38 PRINT : PRINT : PRINT : PRINT :
PRINT
40 INPUT "Bottom Line:";d$
42 IF LEN d$>32 THEN GO TO 40
44 PRINT TAB 16-(LEN d$/2);d$
50 PRINT AT 21,8; FLASH 1;"Correct
(y/n)"
52 IF INKEY$="" THEN GO TO 52
54 IF INKEY$="n" THEN GO TO 10
100 PRINT AT 21,8;" "
INPUT "Number of copies:";x
110 FOR i=1 TO x
115 FOR j=1 TO (32-LEN a$) STEP 2:
PRINT " ";NEXT j
120 LPRINT a$
121 FOR j=1 TO (32-LEN b$) STEP 2:
PRINT " ";NEXT j
122 LPRINT b$
123 FOR j=1 TO (32-LEN c$) STEP 2:
PRINT " ";NEXT j
124 LPRINT c$
126 LPRINT : LPRINT : LPRINT : LPRINT : LPRINT
127 FOR j=1 TO (32-LEN d$) STEP 2:
PRINT " ";NEXT j
128 LPRINT d$
130 LPRINT : LPRINT
132 NEXT i
140 INPUT "More? (y/n)";x$
142 IF x$="y" THEN GO TO 100
```

```
150 INPUT "Another title? (y/n)";x$
152 IF x$="y" THEN GO TO 10
160 CLS : PRINT AT 10,8;"[Work Comp
lete]": STOP
9982 REM GOTO here to save BASIC P
rogram and machine code PRINTDRIVER
on tape
9983 REM
9984 SAVE "PRINT" LINE 9990: SAVE "P
RCODE"CODE 64256,1111
9985 REM
9986 REM Jump to start of your BASI
C program
9987 REM
9988 GO TO 1
9989 REM
9990 REM GOTO here to initialize BAS
IC and load machine code PRINT DRIV
ER
9991 REM
9992 CLEAR 64255: LET PRINTORG=64261
: POKE 26704,INT (PRINTORG/256): PO
KE 26703,PRINTORG-(INT (PRINTORG/25
6))*256: LET MODE=64256: LET TRASH=
MODE+1: LET POS=TRASH+1: LET WIDTH=
POS+1: POKE MODE,1: POKE POS,0: POK
E TRASH,0: POKE WIDTH,79: LOAD ""CO
DE 64256,1111
9993 BORDER 5: PAPER 6: POKE 23609,2
0
9994 REM Jump to start of your BASI
C program
9995 REM
9996 GO TO 1
9998 CLS : PRINT AT 8,0;"Looking for
program from tape...";,,"Star
t Tape Recorder": LOAD ""
```

LEAVE MY STUFF ALONE!  
by William J. Pedersen  
The WIDJUP Co.  
1120 Merrifield S.E.  
Grand Rapids, MI 49507

In all of us there is a deep desire to keep our property safe from observation, damage, theft, and plagiarism. It is human (and corporate) nature. As disturbing as it might be, our fondest hopes are doomed to failure!

Students of cryptography are well aware that few approaches meet the needs for secrecy. All codes can be broken in time. That is quite all right if it takes longer than you need to keep the secret.

Computer programs are code. Anything you write is therefore a form of cryptography. How about that?

Let's take a case in point. Issue #14 of TS Horizons had on Scott's cluttered desk the ubiquitous:

10 ON ERR CONTINUE  
Is it breakable? No sweat.

Under the conditions assumed it works very well, but suppose we change the conditions? Don't load it as a program. Load it as machine code instead.

HOW? You might groan. Well, take it from someone who made a lot of mistakes, including erasing parts of tape records -- make a new header. It should specify that machine code is expected, where to load it, and how much. Put it ahead of the old header. When loading, skip the portion of tape for the old header and continue. You will get a tape error message, but the data has most assuredly been loaded. Now you can look at it, change it, and even print it using appropriate utilities.

Why not read the header? It is "protected". I will not bore you with the how and why of this, nor the way around it. You can say bye-bye to concealment from observation. Unless you can hide the computer from itself, nothing can be hidden. It wouldn't be a computer any more, would it?

For those of you who have damaged your precious and only tape records, there is some hope.

If you have been paying attention, you have learned that you can write tape headers separately. All you need to do is stop the recorder at the one second gap between header and data record.

So far so good. . .but what kind of header do we write? Assuming that if you're still with me, you have the smarts to figure out the others -- here is an immediate instruction set which will almost always work for programs.

EGAD! This is the world's longest REM statement! There is no limit to the length of a statement, except it is impossible to EDIT any that create more than 768 characters on the screen.

Remember that control characters don't show on the screen and tokens generate more than one character. CHR\$(234) generates "R", "E", "M", and " ".

The REM statement has completely replaced A\$(30000). VARS now points to an empty variable list.

### SAVE "FixIt"

This will write the new header, and a very long REM if you let it. We'll settle for just the header.

This header expects a program from PROG to VARS-1, and variables from VARS to E\_LINE (but there are none). We have established these with our long REM statement and by poking VARS.

This header gives an error when it fails to find CHR\$(128) at VARS-1, E\_LINE-1, a valid CHECKSUM byte, or finds an erased section. Any program smaller than the REM statement will load. This includes programs with damage due to accidental POKE's which destroy the line structure. These don't run, but can be mixed using methods similar to the one used here. Immediate commands usually work, even when programs don't.

Programs with erasure gaps and intact headers already load up to the point of the gap. You can save this much by finding the CHR\$(13) at the end of the last intact line, and poking a pair of CHR\$(128)'s after it. Then poke VARS to point to the first CHR\$(128) and enter CLEAR. (Examine it as machine code. You have already seen how.)

Rescuing the part of the program following an erasure gap can sometimes be done by splicing. A machine code program borrowing routines from the EXROM can read anything. If you had it, you wouldn't need any other technique.

Now you have diagnostic, and surgical tools for fixing damage.

About plagiarism --. Nobody in their right mind cares to copy GARBAGE. It must have SOME meaning.

If you really want and need security, there is one reliable way. Encrypt your code using a "public key" scheme. This is a method based on a longer Integer which is the product of two prime numbers. The "public

```

NEW          (Clears program and variables up to RAMTOP)
DIM A$(30000) (Pushes E_LINE up to 56716)
POKE 26710,0:POKE 26711,1: (LINE #1)
POKE 26712,48:POKE 26713,50: (LENGTH - 4)
POKE 26714,234: (REM)
POKE 26715,13: (RETURN)
POKE 26716,128: (END OF BASIC FLAG)
POKE 23627,141:POKE 23628,221 (RESET VARS TO 56717)

```



key" is the long product. The "private key" is either of the primes. The largest binary integer usable with the 2068 is 32 bits. A CRA computer might break a 32 bit code in a few minutes, but why would anyone try?

Theft (or loss if you can't prove it) hurts just as much when the stolen item is useless to the thief as if it were jewels. Always... ALWAYS... keep backup copies, stored away from the cleaning lady, the jelly fingers, the compulsive button pushers.

What has been presented here is not intended to let you penetrate deep secrets for criminal purposes. It is for self-help when things get sticky.

What bugs me is that computer manufacturers have advertised and sold security

systems that my dog could open. Then they try to prosecute the poor guys who penetrate them. It is hard to see who is the bigger thief. TSH

**SOFTGEMS**



PO BOX 119, MAYVILLE, NY 14757

TS-1000-1500-ZX81  
SOFTWARE

### Making 2068 Back-Ups on the A & J Mikrodrive

By E. Arthur Brown

Using Thomas Woods' 2068 Profile has proven to be the most convenient data base for our supplier and media contacts. (I've found it even better than Microsoft's FILE for the Macintosh... a \$200 fiasco software package.) Using it with our 2068 Mikrodrive (same as A & J Mikrodrive), has further enhanced it's utility with extra speed and reliability in saving and loading. I did, initially, have some misgivings about the Mikrodrive versions because there were no easy instructions for making back-ups. I've since figured a convenient method myself and thought it would be a good idea to share my method with others.

LOAD the Mikrodrive version of 2068 Profile from cassette and configure it as per instructions. (If you plan to use the internal mikrodrive printer port, you'll need a patch tape from us which we'll supply for \$5 to cover costs.) This will give you one blank copy of Mikrodrive profile. Now, to make back-ups, you'll need to configure a re-usable loader. With no wafer in the Mikrodrive, LOAD the Mikrodrive version from cassette once again. You should get an error report after the loader has loaded. LIST the Loader program to your screen. Now, DELETE lines 1000-2000 from the Loader program. Next, FORMAT a couple of 5-10 foot wafers using the SAVE "@1,+" command. NOW, insert one of these wafers and SAVE "@.pfile". Save the same thing on the other formatted wafer. You have

just made a Loader which you'll use to prepare other wafers to save Profile and its data. Now, Format as many 35ft or longer wafers as you want to have for Profile back-ups. Then, LOAD "@pfile" LINE1: VERIFY "@pfile". This saves and verifies an auto-run version of the loader to file 1 of each wafer. You now have a set of wafers that are ready to back-up Profile and it's data.

To use these back-ups, you start a file with your original empty Mikrodrive version of Profile. When it's time to SAVE your work, you remove the original wafer and insert one of your prepared wafers. Since the SAVE goes to files 2 and 3, your Profile and data will be readily saved and verified. To make a back-up copy, just SAVE again onto another prepared wafer.

NOTE: Besides speed, the 2068 Mikrodrive should be consistently reliable. If you have frequent tape errors, there is something wrong. After a year of no problems, mine started having frequent tape errors. I used a swab and the cleaning solvent from our computer maintenance kit to clean the head and rollers and the drive returned to its previous reliability.

I hope this back-up procedure is helpful to your readers. If any are confused or have questions, they're welcome to call or write for help.

Sincerely, Eben Brown, E. Arthur Brown Co.  
3404 Pawnee Dr., Alexandria, MN 56308  
(612)762-8847.

# ETCH-AH-SKETCH

For the TS-2068  
by: Richard E. Watts

It's hard to come by a good drawing program with the capabilities represented in this one.

This program was originally written for my uncle's Atari 400 but, after many modifications, I converted it for the 2068 and thought I would share it with other users. I worked on this program two years off and on, so I hope you like it.

Type it in just as is and when you type in the last line, type in RUN 9988. Once this is done compare the output to the output at the end of this article. If they are not the same, find which line or lines the error(s) are in and fix them. (For more information on the "Linecheck" program, see TS Horizons no. 12, page 10.)

Once this is done DELETE lines 9988 through 9999 and then CLEAR and SAVE "etcher" LINE 0. At this point it would be wise to VERIFY the program as well.

**HOW THE PROGRAM WORKS:** Put a joystick in the left port of your computer and RUN the program. After a STOP THE TAPE Intro followed by a fanfare with credits on a yellow screen (for color TV) For black-and-white TV's, change state-ment 4 to "BORDER 7: PAPER 7" ;it cuts down on glare. You will see a flashing dot in the "center" of the screen with a X,Y coordinate at the bottom.

The numbers at the bottom of the screen represents the location of the cursor (flashing dot) on the screen. The number after the "TO:" represents how long the cursor is set by the W key.

Move the joystick in the direction you wish to go and if you wish to leave a dot or line behind, press the button on your joystick. To erase a line, retrace it without pressing the button.

The INKEY\$ letters are described below:

- A->Draws an ellipse on the screen.  
This may take a while depending on how small the ellipse is.
- B->This copies the picture to the printer, if one is attached.
- C->This clears the screen but don't worry if you accidentally hit it because it asks if you're sure you want to do it.
- D->This draws a verticle or horizontal or an angled line and places the cursor at the end of it.
- F->This fills in a certain area but make sure that the cursor is at the lower left or upper left of the area to be filled.
- I->This changes the ink color.

- M->This pauses the cursor so it can't be moved unless another key is hit.
- O->This draws a circle using the circle command built into the computer.
- P->This enables you to print something to the screen. Anything, anywhere. Flashing or not.
- Q->This quits the program. \*(See note below).
- R->This loads a picture from a tape.
- S->This saves a picture to a tape.
- W->This changes the width of the cursor.
- Z->This "Centers" the cursor i.e. X=128, Y=88.
- 4->This sets the increments of the arrow keys. This is set at 8 at the beginning of the program.
- ARROW KEYS->Go in respective directions incremented by the four key.

\* NOTE: After hitting the Q key the program is still in the memory of the computer and a poke 23635,86 is needed to restore the program followed by an INK 0. You will see only a "2" at the top of the screen. You need to edit the line.

## LINE CHECK

|    |      |     |      |      |      |
|----|------|-----|------|------|------|
| 1  | 163  | 66  | 26   | 134  | 399  |
| 2  | -84  | 68  | 455  | 136  | 363  |
| 4  | 638  | 70  | 372  | 138  | -318 |
| 6  | 556  | 72  | 188  | 140  | -57  |
| 8  | 93   | 74  | -17  | 142  | 3    |
| 10 | -303 | 76  | -559 | 144  | 2    |
| 12 | 310  | 78  | 186  | 146  | 551  |
| 14 | -151 | 80  | 137  | 148  | 36   |
| 16 | 136  | 82  | -17  | 150  | -736 |
| 17 | 102  | 84  | 222  | 152  | 159  |
| 18 | 56   | 86  | 200  | 154  | 241  |
| 19 | 293  | 88  | 241  | 156  | 214  |
| 20 | 262  | 89  | 198  | 158  | 2    |
| 21 | 114  | 90  | 251  | 160  | 85   |
| 22 | 86   | 92  | 231  | 162  | 67   |
| 24 | -91  | 94  | 119  | 164  | 217  |
| 26 | 254  | 96  | 126  | 166  | 245  |
| 28 | 273  | 98  | -64  | 167  | 204  |
| 30 | 154  | 100 | 298  | 168  | 121  |
| 32 | 94   | 102 | 76   | 169  | -51  |
| 34 | 348  | 104 | -10  | 170  | 178  |
| 36 | -320 | 106 | 232  | 180  | 241  |
| 38 | -323 | 108 | 241  | 190  | -172 |
| 40 | -326 | 110 | 175  | 200  | -536 |
| 42 | -325 | 112 | 101  | 9988 | 210  |
| 44 | 340  | 114 | 1804 | 9989 | 236  |
| 46 | -264 | 116 | 96   | 9990 | 188  |
| 48 | 164  | 118 | 41   | 9991 | -71  |
| 50 | 286  | 119 | 7    | 9992 | 176  |
| 52 | 80   | 120 | 202  | 9993 | 322  |
| 54 | -522 | 122 | 116  | 9994 | 29   |
| 56 | 158  | 124 | 241  | 9995 | 146  |
| 58 | 262  | 126 | 740  | 9996 | 111  |
| 60 | 80   | 128 | -232 | 9997 | 113  |
| 62 | 52   | 130 | 71   | 9998 | 178  |
| 64 | -57  | 132 | 884  | 9999 | 169  |

## PROGRAM

```

1 REM ETCHER
   CREATED BY R.E. WATTS
2 ON ERR GO TO 4
4 POKE 23561,20: POKE 23609,1
0: POKE 23562,1: POKE 23658,8: F
OR 0=0 TO 2: CLS: BORDER 6: PAP
ER 6: NEXT 0
6 PRINT AT 11,9: FLASH 1:"STO
P THE TAPE:" : FOR X=0 TO 100: BE
EP .005,32: NEXT X: PAUSE 60: CL
S
8 GO SUB 110
10 LET H=0: LET I=8: LET X=128
: LET Y=88: LET U=0

```

```

12 LET ST= STICK (-1,1)
14 IF ST=8 THEN LET X=X+1
16 IF INKEY$="M" THEN PAUSE 0
17 IF INKEY$=CHR$ 33 THEN GO TO 190
18 IF INKEY$="P" THEN GO SUB 9
19 IF INKEY$="F" THEN GO SUB 1
20 IF INKEY$="B" THEN GO SUB 1
21 IF INKEY$="U" THEN INPUT "U
IDTH OF LINE ?";I
22 IF ST=9 THEN LET X=X+1: LET
Y=Y+1
24 IF INKEY$="I" THEN INPUT "U
HAT INK COLOR ?";I: INK I
26 IF INKEY$="D" THEN GO SUB 1
28 IF INKEY$="A" THEN GO SUB 1
30 IF ST=1 THEN LET Y=Y+1
32 IF INKEY$="4" THEN INPUT "I
NCREMENTS OF ?";I
34 IF INKEY$="Q" THEN GO TO 20
36 ON ERR GO TO 44: IF INKEY$=
"5" THEN LET X=X-I
38 ON ERR GO TO 44: IF INKEY$=
"6" THEN LET Y=Y-I
40 ON ERR GO TO 44: IF INKEY$=
"7" THEN LET Y=Y+I
42 ON ERR GO TO 44: IF INKEY$=
"8" THEN LET X=X+I
44 IF ST=10 THEN LET X=X+1: LE
T Y=Y-1
46 IF INKEY$="S" THEN GO SUB 1
48 IF ST=4 THEN LET X=X-1
50 IF INKEY$="R" THEN GO SUB 1
52 IF ST=5 THEN LET X=X-1: LET
Y=Y+1
54 IF INKEY$="Z" THEN LET X=12
8: LET Y=38
56 IF ST=2 THEN LET Y=Y-1
58 IF INKEY$="C" THEN GO SUB 1
60 IF ST=6 THEN LET X=X-1: LET
Y=Y-1
62 IF INKEY$="O" THEN GO SUB 3
64 IF X>255 THEN LET X=0
66 IF Y>175 THEN LET Y=0
68 IF X<0 THEN LET X=255
70 IF Y<0 THEN LET Y=175
72 OVER 0
74 PLOT X,Y: DRAW U,0
76 PRINT #1;AT 0,0;"X=";ABS (X
);TAB 10;"TO:";X+U;TAB 1;AT 1,0;
"Y=";ABS (Y);TAB 10;" "
78 OVER 1
80 IF STICK (2,1)=1 THEN OVER

```

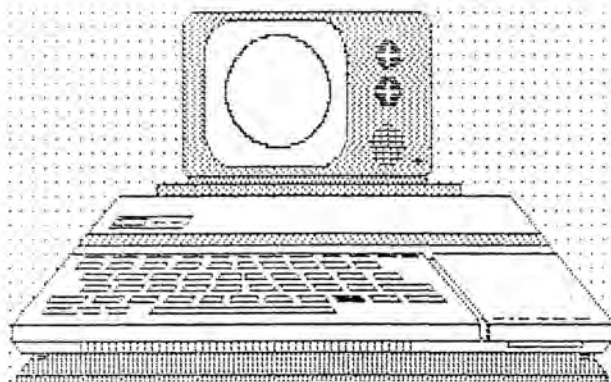
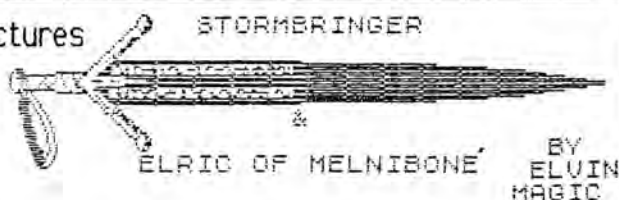
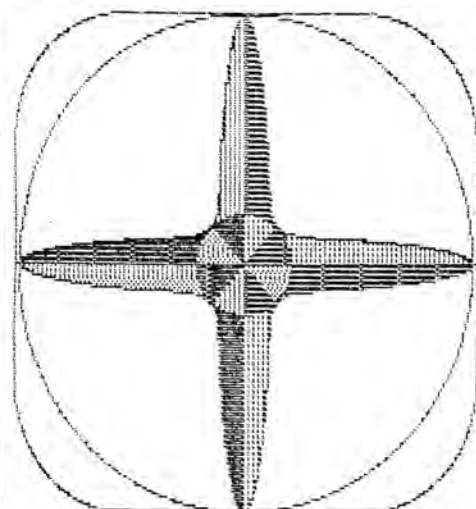
```

82 PLOT X,Y: DRAW U,0
84 GO TO 12
86 INPUT "RADIUS OF CIRCLE ";R
CIRCLE X,Y,R
88 RETURN
89 GO TO 2
90 INPUT "WHAT DO YOU WISH TO
BE PRINTED ";A$
92 INPUT "WHAT LINE(0-21) ";L
94 INPUT "DO YOU WANT IT TO FL
ASH ";B$
96 IF B$="Y" OR B$="YES" THEN
FLASH 1: GO TO 102
98 IF B$="N" OR B$="NO" THEN G
O TO 102
100 GO TO 94
102 INPUT "DO YOU WANT IT CENTE
RED (Y/N) ?";B$: IF B$="Y" THEN
GO TO 106
104 IF B$="N" THEN GO TO 156
106 PRINT AT L,(32-INT (LEN A$
))/2;A$: FLASH 0
108 RETURN
110 DIM Z$(14): LET Y=9: LET Z$
="ETCH-AH-SCETCH": FOR X=1 TO 14
: PRINT AT 11,Y;Z$(X): LET Y=Y+
1: BEEP .005,20+(X-1): PAUSE 1:
NEXT X
112 PRINT AT 15,11;"CREATED BY"
: PAUSE 60: BEEP .1,0: PAUSE 3:
BEEP .1,0: BEEP .1,0: BEEP 1.5,7
114 PRINT AT 19,10; FLASH 1;"EL
VIN MAGIC": PAUSE 30: BEEP .2,0
: BEEP .15,7: BEEP .2,12: BEEP .
2,7: BEEP .2,0: BEEP 1.5,12: PRI
NT AT 21,8;"@ EPS MCHLXXV": PA
USE 240: CLS : RETURN
116 LET M=0: INPUT "DRAW FOWARD
/(-)BACKWARD ";M
118 LET N=0: INPUT "DRAW UP/(-)
DOWN ";N
119 LET ANG=0: INPUT "ANGLE ";A
NG
120 OVER 0: PLOT X,Y: DRAW M,N,
ANG
122 LET X=X+M: LET Y=Y+N: PLOT
X,Y
124 RETURN
126 PRINT #1;AT 0,0;"CLEAR SCRE
EN (Y/N)";AT 1,0;"
IF INKEY$="Y" THEN CLS : GO TO 1
0
128 IF INKEY$="N" THEN PRINT #1
;AT 0,0;"
": RE
TURN
130 GO TO 126
132 PRINT #1;AT 0,0;"COPYING PI
CTURE ";AT 1,0;"
": COPY :
PRINT #1;AT 0,0;"
": RETURN

```

continued on next page...

With this program you can draw pictures like these:



SINCLAIR 2060





# A RIGHT-TO-LEFT PIXEL-BY-PIXEL SCREEN SCROLL by Dick Scoville

As you can see, the following machine code program can be located anywhere you wish. The ideas involved won't be new to readers of my earlier articles in the Triangle Sinclair Users' Group newsletter. (I only hope I haven't given you *exactly* the same thing already!)

It is very easy to double a number that is given in binary, just as it is very easy to multiply a number by 10 if it is given in decimal--in each case, you just add a 0 on the right. That is, twice the number

$x_7\ x_6\ x_5\ x_4\ x_3\ x_2\ x_1\ x_0$

is the number

$x_7\ x_6\ x_5\ x_4\ x_3\ x_2\ x_1\ x_0\ 0$ ,

where the variables  $x_7$  through  $x_0$  represent ones or zeroes.

Since our object is to shift bits to the left, this is a quick way to do it. If our number were in the A register, the instruction

ADD A,A

would "double" it by adding A to itself. Of course if the result is too big, that is, if  $x_7$  is 1 the new contents of the A register will be

$x_6\ x_5\ x_4\ x_3\ x_2\ x_1\ x_0\ 0$ .

and the carry flag would be set (reset if  $x_7$  were 0).

ADC A,A

This instruction is similar to ADD A,A--it will add A to itself but also add one more to the answer if the carry flag was set previously. It will then adjust the carry flag depending on overflow. Here are some examples showing what happens to A and the carry flag after an ADC A, A instruction:

| old<br>A | old<br>carry | new<br>A | new<br>carry |
|----------|--------------|----------|--------------|
| 00000001 | 0            | 00000010 | 0            |
| 01001001 | 1            | 10010011 | 0            |
| 01001001 | 0            | 10010010 | 0            |
| 10110000 | 1            | 01100001 | 1            |
| xabcdefg | y            | abcdefg  | x            |

Here is the program:

|      |            |        |    |
|------|------------|--------|----|
| DD00 | LD HL,FF57 | 21FF57 | 1  |
| DD03 | LD B,20    | 0620   | 2  |
| DD05 | AND A      | A7     | 3  |
| DD06 | LD A,(HL)  | 7E     | 4  |
| DD07 | ADC A, A   | 8F     | 5  |
| DD08 | LD (HL), A | 77     | 6  |
| DD09 | DEC HL     | 2B     | 7  |
| DD0A | DJNZ FA    | 10FA   | 8  |
| DD0C | LD A, 40   | 3E40   | 9  |
| DD0E | AND H      | A4     | 10 |

|      |           |      |    |
|------|-----------|------|----|
| DD0F | LD B,20   | 0620 | 11 |
| DD11 | JR NZ, F3 | 20F3 | 12 |
| DD13 | RET       | C9   | 13 |

Line 1 loads HL with the last byte of the display file (which runs from 4000 to 57FF). We will operate on each pixel row of the screen by looping through its 20 (32 decimal) bytes. We use register B as an index since that is the register that DJNZ uses. Line 3 has the important purpose of making the carry zero. (All the logic operators--AND, OR and XOR-- do this.)

Lines 4 to 8 form the actual loop. When we enter the loop, HL will point to the right-most byte of a pixel row, and the carry will be 0. Keeping in mind how ADC A,A shifts bits to the left, you can see how we have entered a 0 on the right and moved all the other bits to the left. When we leave the loop, that is, when B has finally been decremented to zero, HL will point to the right-most byte of another pixel row, and the carry flag will contain the (unwanted) value of the pixel that has been shoved off the left margin. Of course at this point we might be done, having gone through all the pixel rows. Lines 9 and 10 decide that for us--we will be done only if HL holds a number less than 4000,

|            |      |             |      |
|------------|------|-------------|------|
| 4          | 0    | 0           | 0    |
| 0100       | 0000 | 0000        | 0000 |
| ....H..... |      | .....L..... |      |

that is, only if the bit in H indicated has become 0, that is, only if (H AND 40) is 00.

Line 10 has the further happy effect of resetting the carry flag, which Line 11 does not ruin. Thus in Line 12, if the result of the AND was not zero, we jump back to Line 4, the beginning of the loop, with the carry flag reset.

If you would like to have a Scroll-to-the-Right routine, not very much has to be done--you will want to start at 4000, and increment HL. The test for the end of the screen is a bit messier, but recall that RRA (whose code is 1F) is the perfect analog of ADC A,A. Only the direction of the shift changes. I'll end the article with a simple illustration of the routine in use (DD00=56576dec):

```
10> LET y=100
20 LET y=y+2*INT (2*RND)-1
30 PLOT 255,y
40 LET abc=USR 56576
50 GO TO 20
```

If you think about how RANDOMIZE and USER work, you will understand why replacing LINE 40 with

```
40 RANDOMIZE USR 56576
```

is not such a good idea.

TSH

# FILLER UP

For the TS 1000 / ZX 81

by Walt Coleman

Have you ever had a use for a partial screen clear or a rapid screen fill with a specific character? Then FILLER UP is for you. It's a short (24 byte) machine code routine that can be stored in an opening REM statement or relocated to any of your favorite M/C storage spots (no absolute addresses are used).

To use this routine from a basic program, two lines are required. First a PRINT AT row, column; This will set the point on the screen we wish to clear from (fill with spaces). Then a RAND USR 16514 or LET X=USR 16514 call will execute FILLER UP.

Using the PRINT AT statement allows us to use two Sinclair System Variables in our program. The variable DF.CC at 16398 contains the address that the next byte of the display file will be written to. Likewise variable S.POSN at 16442 contains the line number for the PRINT position. This line number, however, does not correspond to our usual convention (top line being 0, bottom line being 24) but instead numbers the top line as 24 to the bottom line at 1.

For M/C lovers:

| MNEMONICS     | COMMENTS                    |
|---------------|-----------------------------|
| LD HL,(16398) | Load HL w/ PRINT AT pos'n   |
| DEC HL        |                             |
| LD A,(16442)  | Load A w/ number of lines   |
| SUB A,2       | to be filled                |
| LD D,128      | Load D w/ character to be   |
|               | used for fill               |
| LD B,A        | Set up loop counter         |
| INC HL        |                             |
| LD A,(HL)     | Is next character an end of |
| CP 118        | line marker                 |
| JR Z+3        | If yes skip it and decre-   |
|               | ment counter                |
| LD(HL),D      | If no load w/ our character |
| JR-9          | And go to next display char |
| DJNZ-11       | Have all lines been done    |
| RET           | If so return to BASIC       |

So much for explanations. Lets get to the keyboard and see how it works.

STEP 1 : Enter and run the following listing

```

1 REM 12345678901234567890123
4
10 LET A$="2A0E40283A3A40D5021
60047"
20 LET A$=A$+"237EFE7628037218
F710F503"
30 FOR I=1 TO 24
40 POKE (16513+I),16+CODE A$+C
DOE A$(2)-478
50 LET A$=A$(3 TO )
60 NEXT I

```

STEP 2 : Delete lines 10 to 60 being careful not to delete line 1, which now contains FILLER UP,

STEP 3 : Enter and run this listing to demonstrate FILLER UP

```

1 REM E:RANDUURNDCHR$ - 17
RUN (PRINT TAN
10 FOR I=0 TO 21
20 PRINT I,I;AT I,30;I
30 NEXT I
40 FOR I=1 TO 30
50 NEXT I
60 PRINT AT 8,0;
70 RAND USR 16514

```

Line 1 contains M/C program from steps 1 and 2.

Lines 10 to 30 fill the screen.

Lines 40 to 50 provide a delay

Line 60 sets the exact screen position from which we wish to fill

Line 70 calls FILLER UP

To change the fill character POKE 16524,--- with a number between 0 and 63 or between 128 and 191 consulting your manual for the desired character code. To change the fill point change the PRINT AT statement, but be sure to end it with the ,

Isn't it amazing what such a "little toy" can do. The only T/S 1000 limitation is our ingenuity and imagination. If you have any comments or problems, I'm always glad to hear from you.

Walt Coleman  
728 Seville Avenue  
Wilmington, DE 19809

TSH



"...received my moneys worth with just one issue..."

—J. Trenbick

"...always stop to read CTM, even though most other magazines I receive (and write for) only get cursory examination..."

—Fred Blechman, K6UGT

|                               |                              |
|-------------------------------|------------------------------|
| U.S.A.                        | \$15.00 for 1 year           |
| Mexico, Canada                | \$25.00                      |
| Foreign                       | \$35.00(land) - \$55.00(air) |
| (U.S. funds only)             |                              |
| Permanent (U.S. Subscription) | \$100.00                     |
| Sample Copy                   | \$3.50                       |

**CHET LAMBERT, W4WDR**

1704 Sam Drive • Birmingham, AL 35235  
(205) 854 0271



## TEXTWRITER 1000 ENHANCEMENTS

By John Ezike

One of the best word processors around for the ZX/TS computers is TEXTWRITER 1000 by Robert Fingerle (see review in *Sync* Jan/Feb 84). However, there are a few enhancements that I found which make it even easier to use.

In type mode, screen flicker can be a bit of a problem. If you have a video inverter board (see *Popular Electronics* 5/83) it is not so bad. The following lines will eliminate screen flicker, enable auto repeat when any key is held down, without affecting the normal operation of the program. Deleting characters will be slightly slower. LOAD "" and after the menu comes up enter STOP (SHIFT-A) to break out of the program. Enter LIST 135 then type and enter 160 to delete the line. Add the following lines.

```
140 SLOW
173 IF A$="" THEN GOTO 170
```

The following lines simplify the task of printing multiple copies of your file. If you enter option 4 or 5 from the main menu a prompt will require that you enter the number of copies you want. The familiar prompts requesting the start and final lines will then be displayed. Enter LIST 80 and using the down cursor (SHIFT-6) and edit key (SHIFT-1), renumber line 97 so it is now line 98. Also renumber line 95 so it is now line 97. Add the following lines:


```
86 IF LN=4 OR LN=5 THEN GOTO 95
88 GOTO 98
95 PRINT AT 16,0;"ENTER NUMBER OF COPIES"
96 INPUT NC
```

```
5535 FOR O=1 TO NC
5595 NEXT O
```

In lines 5535 and 5595 the "O" used as a variable is the letter and not zero. Enter GOTO 35 and select option 3 from the menu to save. DO NOT USE RUN !! Happy computing!

JOHN EZIKE  
1619 GRANT ST. APT. 6  
BERKELEY, CA. 94703

TSH



**WOW!**

POWERFUL, FULLY PROGRAMMABLE WITH 2K OF MEMORY—PORTABLE—8.75" x 10.9" INCH MODULE. SINGLE KEY ENTRY COMMANDS—DURABLE 40 KEY MEMBRANE TYPE KEYBOARD—Z80A BASED FOUR CHIP DESIGN—EDUCATIONAL—UNIQUE SYNTAX-CHECK REPORT CODES FOR ERROR IDENTIFICATION—GRAPH DRAWING AND ANIMATED DISPLAY—ADAPTABLE TO 8-12 DECIMAL PLACES FOR FULL RANGE MATH AND SCIENTIFIC FUNCTIONS—AT AN AFFORDABLE PRICE.

WE CANNOT TELL YOU THE MAKE OF THE COMPUTER BUT IT WAS MADE BY A FAMOUS WATCH COMPANY. THEY USED TO SELL FOR \$69.95.

WE BOUGHT OUT WHAT THE FACTORY HAD LEFT IN STOCK AND HAD TO REMOVE THE LABELS. THESE UNITS ARE UNPACKAGED. LESS THE 9V WALL ADAPTER AND MANUAL BECAUSE THIS IS A DISCONTINUED ITEM THERE IS NO WARRANTY.

GET THEM WHILE THEY LAST

LIMITED SUPPLY

AT LAST!! A VERY AFFORDABLE COMPUTER  
AT A VERY AFFORDABLE PRICE

BUY 1st UNIT FOR \$19.95    BUY 2nd FOR \$18.95    9V DC WALL ADAPTOR    \$4.95  
BUY THE 3rd UNIT (NON OPERATING FOR PARTS) \$10.95    MANUAL (OVER 150 PAGES)    \$2.95

See September 1984 issue of 73 for TIMEX/RTTY article

---

**CHIP BONANZA (AT THESE PRICES THEY ARE A STEAL)**

|                                                 |       |                             |
|-------------------------------------------------|-------|-----------------------------|
| 2708                                            | ..... | \$1.00 EA OR 10 FOR \$9.00  |
| 2716                                            | ..... | \$2.25 EA OR 10 FOR \$20.00 |
| 2732                                            | ..... | \$3.25 EA OR 10 FOR \$30.00 |
| 2734                                            | ..... | \$4.00 EA OR 10 FOR \$35.00 |
| 2736                                            | ..... | \$7.00 EA OR 10 FOR \$65.00 |
| 6802                                            | ..... | \$4.95 EA OR 10 FOR \$45.00 |
| 6810                                            | ..... | \$1.95 EA OR 10 FOR \$15.00 |
| 6800                                            | ..... | \$5.95 EA OR 10 FOR \$50.00 |
| 6821                                            | ..... | \$2.95 EA OR 10 FOR \$25.00 |
| 6115                                            | ..... | \$ 8 FOR \$ 5.95            |
| 4134                                            | ..... | \$ 8 FOR \$12.95            |
| 384201                                          | ..... | (SPECIAL) \$ 2.95           |
| TMS 9901AL MICRO P 84 MH 8 BIT DIB + 16 BIT CPU | ..... | \$ 4.95                     |
| TMS 9901AL MICRO P 84                           | ..... | \$ 2.95                     |
| TMS 9901AL MICRO P CLOCK GEN. AND DRIVER        | ..... | \$ 5.95                     |
| TMS 9918AL MICRO P COLOR GRAPHICS AND DISPLAY   | ..... | \$ 9.95                     |
| KEYBOARD (96/40 KEYS MEASURE) x 10HITTED        | ..... | \$ 9.95                     |

APPLE II AND APPLE II+ COMPUTER  
MAIN FRAMES fully populated..... \$170  
Power supply, case and keyboard, separately available..... Call or Write  
Unit as described above, fully assembled & tested..... \$250 plus shipping

APPLE POWER SUPPLIES    \$29.95

**Cassette Software:**

1 have written software.....  
..... send for list (pg \$9.95-\$14.95)  
Hal's Special Price: 1 for \$3.95;  
3 for \$10.95, 8 for \$19.95  
10 for \$29.95, 20 for \$50.00  
or let Hal select 25 without cash  
discounts (my choice) at 25 for \$50.00!!!

---

SHIPPING INFORMATION: ORDERS OVER \$25 WILL BE SHIPPED POSTPAID EXCEPT ON ITEMS WHERE ADDITIONAL CHARGES ARE REQUESTED. ORDERS LESS THAN \$25 PLEASE INCLUDE ADDITIONAL \$2.50 FOR HANDLING AND MAILING CHARGES. MICHIGAN RESIDENTS ADD 4% SALES TAX. SEND 30¢ STAMP OR BASE FOR FREE FLYER. CANADIAN ORDERS ADD \$5.00 POSTAGE IN U.S. FUNDS.

**HAL-TRONIX, INC.**  
P.O. BOX 1101 - DEPT. HR  
SOUTHGATE, MICH. 48195  
PHONE (313) 285-1782

"HAL" HAROLD C. NOWLAND  
W8ZXH

**LARKEN**

## DISK DRIVE

CONTROLLER BOARD FOR TS 2068

SPECTRUM EMULATOR COMPATIBLE

- High speed loads 32k bytes in 7.5 seconds
  - commands are LOAD SAVE DIRECTORY DELETE FORMAT COPY MOVE and BADBLOCKS
  - Uses IBM PC compatible 5 1/4" double sided disk drives (SHUGART SA455 or compatible)
  - Disk capacity 160 k bytes
  - Dos is on a bank switched 2K eeprom
  - Only 1 USR call is required
  - Assembled and tested, all cables and connectors supplied
  - Single drive version is available now but a second drive can be easily added (this mod will be available before FEB 86)
  - 60 day money back guarantee
  - Made in CANADA, many already in use
- Price  
\$95.00(US) + \$6.00 shipping

From LARKEN ELECTRONICS  
RR#2 NAVAN ONTARIO  
CANADA K4B-1H9

TS1000/2101 SOFTWARE CLOSING...  
Software cassettes from \$5.99! Catalog/Closures  
11st Free: SIMULATION-12, Box 2382, La Jolla, CA 92038.

# Surplus Keyboard Improvements for Extra Shifted Keys

by Walter  
Komlosy

The TI 99-4A keyboards, still widely available, are an ideal unit for the ZX81/Timex 1000 computers. Recent and not so recent articles have shown how the shifted keys on the KB-0 line can be connected using two diodes. This method can give you four useful and often used shifted keys: EDIT, DELETE, quotation marks("), and FUNCTION. It can also give you STOP and "", which are not of so much use.

However there are other shifted keys, that are very often used, which can be hooked up using the diagram shown in figure 1. As you will see one CMOS 4016 I.C. can provide you with any 3 shifted keys you want by proper connections. For the TI 99 keyboard only one 4016 is used and I have connected my own keyboard as per the diagram to give me graphics and the move left and move right arrows on keys 5 and 8: these three additional keys make program entry much easier and faster.

Since the TI keyboard has a 15 pin connector attached and only 13 pins are used for the keyboard on the computer, the two additional pins can be wired to carry the needed +5V and ground to power the 4016 from the computer.

I used double-sided foam tape to mount the 4016 at the top corner of the TI P.C. board, behind the 0 key. Before mounting, bend all 14 leads straight out from the body of the 4016 so it looks like a flatpack I.C. This will make the mounted assembly less than 1/4" high, and should not interfere with your own method of mounting your keyboard. Connections and the six diodes and four 10K resistors are now wired as per the diagram. Finally wire up the two unused pins on your keyboard (first isolating them by cutting any traces to the pin donuts at the 15 donut connector array at the top of the TI board). Run two wires of appropriate length to the computer +5V and ground traces (you will have to trace them out first) and the revision will be complete.

Should you find that your keyboard works erratically on some shifted keys (mostly on the A-S-D-F-G line), then the fix is to connect a 27K 1/4W resistor from the +5V pin 14 to the KB-0 pin 11 of the 4016. It might be a good idea to include this resistor as part of the revision, since it will do no harm and may avoid shift problems.

For other keyboards with many extra keys, you can use as many 4016 I.C.S as you need to wire up other shifted keys you want. Each 4016 will handle three shifted keys, since one CMOS switch of each I.C. used must control the shift line from D6 to KB-0.

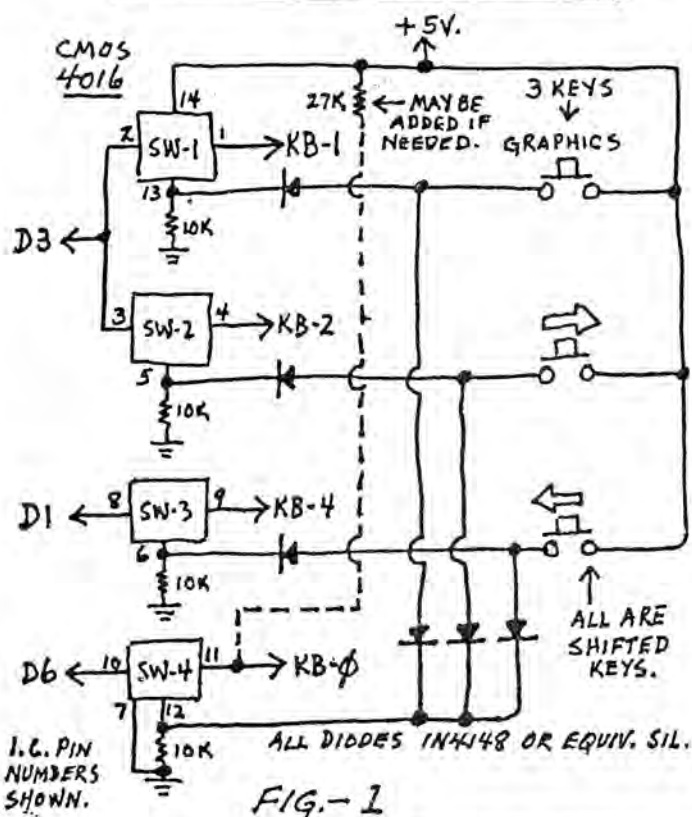
What to do with your TI99-4A key tops.

Revising the above keyboard for the ZX81/Timex 1000 has been well documented in the past; however, not much has been written about what to do about the key tops. This article is about my solution to the above problem.

Years ago, when I received my first ZX81 kit from Sinclair, it arrived with a bad stick-on keyboard, which was promptly replaced and I ended up with two. I kept the bad unit in a sealed poastic bag and years later used it to cover my first full size keyboard from TI surplus.

That tells you the where; now here is the how:

WIRE +5V. AND  $\overline{\text{GND}}$  TO THE TWO UNUSED DONUTS OF 15 DONUT CONNECTOR ARRAY - TOP OF KEYBOARD.



Assuming you have a bad keyboard due to the mylar connection strips and your computer is apart for repair.

First you must assemble what you will need for the job. Get a piece of slippery backing paper from self stick labels, etc. large enough to cover the membrane keyboard. You also need a metal straight edge ruler, a new blade in your exacto knife, a clean, sharp scissors, a sharp miniature flush cut pliers, small thin screwdriver, small pliers with serrated jaws and some cleaning solvent that leaves no residue.

Take the screwdriver and pry up the two lower edges of the membrane keyboard. With the serrated pliers grasp those edges and slowly pull the membrane from the case. Do not allow the pliers to touch any areas with keys and do not touch the sticky back of the keyboard. When it is free of the case place it carefully, sticky side down, onto the slippery side of the backing paper. Press it firmly to the backing paper all around so that dust can not get to the sticky surface. Now you can cut off the mylar connecting strips at the top.

Get a piece of cardboard (not corrugated) and lay it on a flat, stable surface; then place the membrane keyboard with its backing, printed keys face up and using the metal edge ruler, held very firmly in place, cut the bottom edge off the membrane about 1/64" below the white function legends at the bottom of the lowest line of keys. In a straight, clean cut.

Now you must cut off the top edge of the membrane. Here you have no printing to use as a guide. Mark off 3/32" above the white portions of the top row of keys and use those marks as a guide to cut the top edge off. You should end up with 3/32" of black membrane above the top row of keys and the same black area should be left on the bottom row of keys where no legends exist below the white part of the keys.

Next you must make three cuts, very, very, carefully; cut between each row of 10 keys, making sure not to cut into the small white printing above and below each key. You should end up with four strips of 10 keys, three of which will have small printing above and below in white and the top strip, which should have a black border along the top and bottom of the strip.

Now, with sharp scissors, separate the keys in each strip by cutting them apart exactly in the center of the black space between each key. Do this for all four strips and you will end up with 40 key tips with backing paper on each key. Set them up in rows as they were on the Timex and take your TI keyboard and clean off all the TI key tops with the solvent cleaner. When they are clean and dry, take out each membrane key top, peel off the backing and press it in place onto the TI keys. Line them up carefully before pressing them firmly into the curved contour of each key. Start with

the lowest line of keys at shift, work across, then start the second line at the left. Caution: do not touch any of the TI keys with your fingers after cleaning them.

Depending on how you configured your TI keyboard, certain right side keys will be moved around. Space and enter will have been moved to the large space bar and the one large space bar will make those changes to fit your format.

Once you have all your membrane tops aligned and firmly pressed at the TI keys you must remove each key from the keyboard by prying them off gently with a screwdriver; begin with the top row and work your way down. No need to remove the lowest row of four keys.

With your sharp flush cutting pliers, flush cutting edge against the keys, trim off any excess membrane along both sides of each key and round off all four key corners. You should end up with an easily readable keytop, with all the Timex legends intact, that will not abrade or deteriorate with constant use.

After trimming push the keys back on the key switches and admire your new keyboard.

For my own extra keys I used self stick white labels with 1/8" Datak red lettering coated with Datacoat protective coating. Much use tends to wear off the coating and I now cover those keys with transparent yellow mylar tape which has a tough and durable surface and makes the shifted keys prominent.

My two TI keyboards have functioned beautifully and have stood the test of time well. None of the membrane tops have fallen off or lost any legibility after years of constant use. TSH

**\*\* Aerco FD-68 Software \*\***  
*Disk File Manager:* Lists detailed directory and occupied tracks. Checks disk. Copies single or all files on disk, even if you have only ONE disk drive. Optional printer output. 5.25 DD disk or tape. \$16.00  
*OmniDisk:* Conversion program for Omnicalc (v. 64000). Customize all colors and keyboard buzz. Supports both tape and disk save/load. 5.25 DD disk or tape. \$9.00  
*MSDisk:* Conversion program for MSscript. Customize paper/ink and various default values. Supports both tape and disk save/load. 5.25 DD disk or tape. \$9.00  
**TS1000 and 2068 Programs**  
*Vocabuilder:* Vocabulary learning program. Requires 16K+ RAM. Tape only. VB-1000, \$12.00 VB-2068, \$16.00  
*Word Twister:* Design your own word-search puzzle. 16K+ RAM. Tape only. WT-1000, \$10.00 WT-2068, \$13.00  
Prices include shipping. Specify tape or disk.  
Please send SASE for information or check/money order to: Chia-Chi Chao, 73 Sullivan Dr., Moraga, Ca. 94556



# ZX 81 NEWS AND RESOURCES

BY PETER McMULLIN

This column is, once again, devoted to a lengthy product review. I'm planning a catch-up on resource/supplier listings next issue, but a couple of items deserve immediate mention:

## HARDCORE HARDWARE HOBBYIST HANDBOOK

ZX81 hardware expert Bruce Taylor, of Budget Robotics & Computing, Box 18616, Tucson, AZ 85731, has announced the release of his book, **BUILD A MICRO-COMPUTER CONTROLLED ROBOT AND OTHER COMPUTER CONTROL PROJECTS**. (QUITE A MOUTHFUL).

TAB Books had owned the rights for over a year, then decided not to publish. After this runaround, Mr. Taylor's company bought back the rights and is now publishing the book. This book presents the design of an award-winning robot in thoroughly documented project form, and promises to be a valuable reference on interfacing just about anything. Printed circuit boards will be available from Budget Robotics for every project in the book. Chapter topics include Adjustable Power Supply, 8255 PIO Board, Digital Voice Synthesizer, Stepper Motor Drivers, Optical Encoders, Polaroid Ultrasonic Ranging kit, and others. Over 200 8.5"x11" pages, 80+ illustrations, 60+ tables, loosebound. Price: US \$13 ppd.

For a sample of previously published work, see "Robotics on a Budget," p. 18, SYNC Vol. 3 No. 4; Also "Home Control on a Budget," p. 31, SYNC Vol. 4 No. 1; both by Bruce C. Taylor.

Budget Robotics holds rights to an improved version of the Computer Continuum buffered expansion board, as well as the Zedex RX81, an inexpensive general purpose parallel I/O board. Write for details - Bruce replies promptly.

## HOLY MODEM, BATMAN

Westridge 2050 Modems, tested, with phone cables but no case or power supply are available from Dave Clifford, 13910 Halldale Av., Gardena CA 90249, 213-516-6648. The price? \$25.00 for one, three or more for \$22.50 each, ten or more for \$20.00 each. Including delivery. At time of writing Dave indicated that he had about 1500 left. However, he also has an undisclosed number of untested boards which are missing a couple of minor parts (an LED and resistor). Plans are to sell these as-is at an even cheaper price, including a complete schematic and parts ID for the hacker.

Needless to say I ordered my modem the same day I heard about Mr. Clifford, as well

as a copy of MINI-XMOD 1.7, at \$20.00 from WEYMIL corp., Box 5904, Bellingham WA 98227-5904.

MINI-XMOD is terminal software which is said to be the best available for the ZX81/TS1000 (or the 2068). Dave Clifford indicated that he would be working on a version of MINI-XMOD for the 2068, first a 32-column version, then a 64-column version. It would be an interesting challenge to work up a 64 column version for the JLC Video TS 1000!

## HARDWARE REVIEW

Subject: Aerco FD-ZX Floppy Disk System  
Source: Aerco, 7606 Robalo Rd,  
Austin TX 78757

FD-ZX Floppy Disk Controller Board and DOS: \$179.00  
Auto Boot ROM Board: \$59.00  
Auto Boot ROM Board with Centronics I/F: \$99.00

Complete packages are also available.  
NOTE: See "Bug Alert", last issue for a discussion of the Boot ROM/Centronics board.

## BASIC TECHNICAL SPECIFICATIONS

Drive type: Shugart compatible 3", 5" or 8" drives, 1 or 2 side, SD or DD, 35 or 40 tracks per side.  
# of drives: up to 4.  
DS/DD Capacity: 400K bytes.  
Disk Format: IBM readable, 10 sectors per track, 512 bytes per sector.  
# Files per disk: up to 20 (as 4-track pages) up to 6 (as 12-track pages)  
Memory use: 2K DOS in EPROM, and FDC at 12-14K FDC I/O is memory-mapped.  
Format DSDD: approx. 35 seconds.  
Copy DSDD-DSDD: approx. 1 minute, 5 seconds.  
Avg. LOAD/SAVE: 3 sec. (20K page) 5 sec. (60K page)  
Error Reports: WRITE PROTECTED; INSUFF. RAM; DISK ERROR.  
Physical size: Circuit board is approx. 4.5 x 6", gold finger extensions.  
Special ICs: 1797 FDC (Siemens); 9216 Data separator.

What do you see when you open the box containing your newly arrived AERCO FD-ZX? One uncased controller board, a computer bus ribbon cable, one floppy disk, and a 16 page manual. What else do you need? Disk drive(s), drive cables, cases and power supply. Aerco's manual gives reasonably easy-to-follow instructions for hooking up your system, and has several useful illustrations. The power supply must provide +12V at 2-3 amps and +5 at 3 amps. The drive cable required is a standard IBM/Shugart 34 conductor pc-edge type. If you follow Aerco's instructions to the letter, you will likely void any warrentee on your new drives. The FDC board gets its +5V and +12V supplies via pins 2 and 34 on the disk drive edge connector. Pin 34 is normally unused, but pin 2 is connected on some drives. Aerco recommends you cut any traces going to pins 2 or 34 on the drive and

jumper these over to the power supply pins. This way you connect the power supply only to one drive, and the FDC board and other drives get powered through the ribbon cable. The result is tidy but I hate to hack up a new drive! The alternative would be to cut wires 2 and 34 adjacent to the controller card, and run separate power leads to everything. I did it Aerco's way.

Having hooked up drives and power supply, the FD-ZX plugs into the supplied ribbon cable; then the RAM pack, etc. onto the ribbon cable's male edge extender, and we're ready to see what's on Aerco's "master" disk.

On application of power, the K cursor appears. Following Aerco's instructions, the master disk is placed in drive A. The command RAND USR 13303 initialises the DOS, and loads "page 1" from the disk. The following menu appears on the screen in about 3 seconds:

WELCOME TO SADOS+ 16K 8/83

```
C COPY DISK (REQUIRES 2 DRIVES)
D DISK UTILITIES
E ENTER NAMES IN DIRECTORY
F FORMAT DISK IN DRIVE A
H HEX MONITOR
L LOAD MEMORY FROM DISK
Q QUIT
S SAVE MEMORY ON DISK
```

Nothing too surprising here. Some further exploration of the manual reveals some interesting facts. All DOS functions are accessed via RAND USR commands. The "DOS" program supplied on page 1 of the master disk serves two purposes: 1) It is a "user-friendly interface" (oh cliché, cliché!) to the DOS USR routines, and 2) It contains the Disk Directory.

Two different DOS control programs are supplied: a "16K" version and a "64K" version. (All capacities specified here are for a 40 track, DSDD drive.)

The 16K DOS permits 20 programs or data files to be saved on a disk. The disk is divided into 20 4-track pages. Any program saved occupies one page, regardless of whether it is a 1K program or a full 16K program. Each "16K" disk page will actually hold up to 20K full of data. Thus it is extremely unlikely that you will ever use the full potential storage capacity of the disk. The 64K DOS assigns 6 pages per disk, each page having a capacity of 60K bytes. It is otherwise identical to the 16K DOS program.

The Aerco DOS does not record a filename with each program, nor does it automatically maintain a directory. Programs are loaded and saved by page number. It is the user's responsibility to keep the directory on page 1 updated.

Converting a breakable program to a disk version is quite easy. Aerco uses sequential USR calls for SAVE and LOAD commands:

RAND USR (12720 + PAGE) to SAVE a specified page or RAND USR (12290 + PAGE) to LOAD from a specified page. After loading the program from tape, the DOS must be initialised by the command RAND USR 12865. This command initialises the FDC and loads certain DOS parameters into bytes 16507/16508. Thus the lines:

```
9900 SAVE "PROGRAM"
9910 CLS
9920 RUN
```

...would be replaced by the lines:

```
9900 RAND USR 12865
9905 RAND USR 12722
9910 CLS
9920 RUN
```

In this example, a GOTO 9900 would save the program to page 2 on the disk, and autorun. When the program is reloaded, it will come up in the same mode (SLOW/FAST) as when it as saved. To save the program on, say, page 6 instead of page 2, line 9905 would read "RAND USR 12726."

Having saved a program, it must be entered in the directory. So, entering RAND USR 13303 brings up the SADOS menu. Pressing E gets a prompt asking which page you want to name, followed by the entry of the program name. Having done this, you must re-save the updated directory to page 1. This is offered as a Y/N option when you finish making directory entries, or it can be done by pressing the S at the main menu. Now if you hit L at the menu, the directory appears, listing pages 1 through 20 and their contents. Any program may be loaded by

\*\*\*\*\*

\* Attention SINCLAIR and TIMEX/SINCLAIR users!! \*

\* HARDWARE and COMPUTER CONTROL projects \*

\* for ZX81, TS1000, TS1500 and some for TS2068 too! \*

\* \* \*

## BUILD A MICROCOMPUTER- CONTROLLED ROBOT

AND OTHER COMPUTER CONTROL PROJECTS

BY B. C. TAYLOR

The best  
"How to"  
and  
"Learn by  
doing"  
robotics  
and  
computer  
control  
book  
available.

\* \* \*

\* Are you tired of books which are full of useless \*

\* projects that the author obviously never built? \*

\* \* \*

\* Do you want to learn about computer control and \*

\* robotics by actually building and operating \*

\* equipment that doesn't cost thousands of dollars? \*

\* \* \*

\* Then this is the book for you! \*

\* \* \*

\* The book gives complete details so you can build \*

\* a Golden Droid Award winning internally computer \*

\* controlled robot for a few hundred dollars. \*

\* \* \*

\* Plus other inexpensive control projects too! \*

\* \* \*

\* The price is just \$10.95 + \$2.05 shipping (\$13.00 \*

\* total). Send your check or money order to: BUDGET \*

\* ROBOTICS & COMPUTING, BOX 18616, TUCSON, AZ 85731 \*

\* \* \*

\*\*\*\*\*

TS 1000 Programs from HCS SERVICES, P.O.Box 1754, Portsmouth, OH 45662  
 Price \$2.45 (add \$1.25 P&H per order). Money back guarantee.  
 Quantities limited. Please specify second and third choices as alternates.

### Games

Mixed Game Bag  
 Supermaze-"pacman"  
 Hangman- just like the childrens' game  
 TS Destroyer / Space Raider\*  
 Space Commando\*-adventure game  
 Strategy Football  
 Fortress of Zorlac  
 Meteorites\*-like the arcade game

### Education

College Cost Analyzer  
 Teachers Grade Book  
 Punctuation Master  
 Quiz Kit\*\*- create your own computerized multiple choice quizzes  
 Alpha Vowel Tutor\*-for younger school-aged children

### Miscellaneous

Home Asset Manager Stamp Collector  
 Coupon Manager Biorhythms\*  
 Guitar for Beginners Carpooler

### Finance

Stock Market Technical Analyzer  
 Stock Option Analyzer  
 Real Estate Investment Analyzer  
 Stock Market Calculator\*  
 Statistics  
 Money Analyzer I  
 Money Analyzer II  
 Critical Path Analysis  
 Manufacturing Control  
 Inventory Control

NOTE: Most programs require 16K RAM

All programs by Timex-Sinclair except:  
 \*by Softsync, Inc. \*\*by Time Works, Inc.

Timex / Sinclair Owners...  
**TAKE A LOOK!**

## TIME DESIGNS MAGAZINE

FOR YOUR  
 2068 - 1000/1500 - SPECTRUM

- \* Readers nationwide (and Canada too!)
- \* 36 Illustrated Pages
- \* Published "On Time"
- \* Interesting Articles / Programs
- \* Current Information
- \* Exclusive "T/S Shopper" Guide

**SUBSCRIBE TODAY!**



**ONLY  
 \$15 year  
 SIX ISSUES**

SAVE \$3.00 Off Newstand Price... Send Coupon (or a copy) with Check or Money Order for \$15 (U.S. Funds Only) to address posted below. We will start your subscription right away upon receipt of your order.

TIME DESIGNS MAGAZINE COMPANY  
 29722 Hull Rd. • Cotton, Oregon 97017

Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City / State: \_\_\_\_\_ Zip: \_\_\_\_\_



## The Sinclair/Timex User's Magazine

Hardware Projects • Hardware Reviews  
 Software Reviews • Product Comparisons  
 Published Monthly • Back Issues Available  
 Free Personal Ads for Subscribers

SUM Magazine is aimed at Sinclair and Timex users who want to learn what is available for their computers, how to do things no one else is doing, and what is just over the horizon. Examples of recent articles include: Reviewing the Portuguese Disk Drive System; Rotronics Wafadrive Review; Hi-Res Graphics for TS-1000; Build Your Own Printer Interface; & a series on Beginner's Programming.

SUM Magazine invites articles, reviews, and projects for possible publication. We pay for articles published! Hardware and software producers are invited to submit their products for review.

Annual Subscription/12 Issues (U.S.) ..... \$15  
 Sample Copy—\$1.00

**SUM Magazine**  
 3224 NW 30 Avenue — Gainesville, Florida 32605  
 904/378-9000 or 462-1086



entering its page number, or you may copy the directory to your printer.

D, for DISK UTILITIES, provides selection of PROGRAM or DATA mode, of Disk Drive A, B, C, or D; Single or Double Density, and also a Clear Directory command. In Data mode all variables are saved and loaded, without the Basic program. When re-loading data, no test is made for variables space. Variables must already have been dimensioned or declared so there is enough room between VARS and ELINE for the disk file to load into. With an understanding of these limitations, the Data mode can be very useful. I've successfully programmed a version of WSI.5 which loads and saves data files ONLY; up to 20 16,000 byte text files, each saved with a filename string. The program will sequentially search a disk for any named file, and print an automatically maintained directory. I'm sure that versions of ZX PRO-FILE (or other file handling programs) could be modified to sequentially search a whole disk, if necessary to find an entry.

**CPU and BUS LOADING:** I had just gotten a few programs saved to disk, and was marveling at the speed of program access, when I realized I had problems—random load errors galore. Bytes were simply dropping out of programs. Suspecting bus speed/loading problems, I singled out 2 possible culprits: my CPU, and the ribbon cable provided by Aerco. The NEC D780C CPU in my computer is a notoriously substandard Z80 chip, so I replaced it with a new Zilog Z80B. The Z80B is designed for operation at up to 6MHz., thus has lower intrinsic capacitance, and “stiffer” bus drivers than the slower versions. At the same time, I nixed the ribbon cable, and plugged everything into my new JLO 6-slot motherboard. A ribbon cable can have 5-10 times the capacitive crosstalk as a motherboard the same length, so I figured this would help. Not so simple, though. The male edge connector on the FD-ZX is a mirror-image of that needed by the JLO motherboard! Thus, I had to fashion a “side-swapper” adapter to plug everything together. Having done all this, the problems completely disappeared, and the disk system has been 100% reliable ever since. I don't know whether the CPU or the motherboard was the significant factor, but the combination licked the problem.

**IN CONCLUSION,** the AERCO FD-ZX system has made a “disk convert” out of this ZX81 hobbyist. The hardware is of good quality and is well assembled. The DOS control program is certainly utilitarian, although some resourceful programming can make it do many impressive things. The existing DOS control software simply doesn't take advantage of the FD-ZX hardware's potential. Aerco's documentation is quite thorough, and provides a few clues to accessing more sophisticated DOS commands thru machine code. The incredible speed of reliable access to a large number of programs or files makes it easy to overlook the short-

comings of the DOS.

#### FROM ACROSS THE POND

Thanks to colleague Larry Chavarie of Ottawa, (who subscribes to even more publications than I do), I will be listing a number of British concerns which continue to support the ZX81 aftermarket. MAPLIN ELECTRONIC SUPPLIES LTD., P.O. Box 3, Rayleigh, Essex, England SS6 8LR, tel. (0702) 554155, is the U.K. dealer for Heathkit, but that's only part of the picture. Maplin offers no fewer than 9 hardware project kits for the ZX81, including a full-sized keyboard, sound and speech generators, a TV sound/inverse video kit, modem interface, extendi-RAM, and hi-res graphics module. Prices are very reasonable. Most of these are male-only cards which are also compatible with motherboards available in the U.S. from John Oliger and Budget Robotics and Computing. Maplin still offers over 15 books about the ZX81 (with something for everyone), and publish their own electronics project magazine. 12 issues are currently available, and almost every one has a ZX81 project! (How about a ZX81 navigation/autopilot system for your yacht?!)

Larry tells me Maplin gives prompt, reliable service. 450 page catalog is £1.35. If you wish to exercise the plastic, Maplin accepts Visa and Mastercard (called BarclayCard and Access in the U.K.). Check this company out.

TSH

## curry computer

P.O. Box 5607

Glendale, Arizona 85312-5607, U.S.A.

Telephone: 1-602-978-2902

Telex (Via WUI): 6501267701

“We have had a QL for about one week now and are just beginning to appreciate the power and versatility it contains. Keep in mind that for the price . . . There is nothing that compares with it.”

#### The QL Report

published by Curry Computer  
February 1, 1985

We know the QL . . . we've been appreciating it longer.

**Write for our free catalog.**

# Part-Way Down the Road With Partial Pascal by Tex Faucette

Partial Pascal from Semper Software (585 Glenn Ellyn Place, Glenn Ellyn, Illinois 60137) was the subject of an earlier review. This is a follow-up which includes a book review plus other "adventures" with Partial Pascal.

First, the book:

"FROM BASIC TO PASCAL" by Ronald W. Anderson. Copyright 1982 by Tab Books, Inc., Blue Ridge Summit, PA 17214. ISBN 0-8306-1466-4 (pbk).

Ronald W. Anderson is "my kind" of writer, and FROM BASIC TO PASCAL is "my kind" of book! Read on.

In the authors own words the book, "...has been

prepared primarily for those with a knowledge of Basic and little or no formal training in Computer Science." That fits. Later on he states, "[you] may be annoyed by the compiler being so picky". On the subject of compilers he also notes that, "...by the time you have gotten your Pascal Program to compile without any detected errors, it is pretty close to running (though not necessarily correctly)."

AMEN, Brother, tell it like it is!

Heeding those and other warnings, I proceeded to apply Mr. Anderson's text and programs to Partial Pascal... or was it vice-versa? Whatever, the results of my excursions were interesting, informative, frustrating, educational, and just plain fun. Successful? Well, maybe.

Since the book had made some mention of the variety of compilers available, and variety of results they sometimes yielded, it was not really a surprise to me when Partial Pascal detected errors where none were visible. Or that supposedly error-free object code occasionally behaved in a strange manner. The big surprise,

```
PROGRAM PRIMESIV(INPUT,OUTPUT);
VAR
  MAX,
  PRIMPTR,
  J,N,
  INTERVAL,
  COUNT,
  HALFMAX,
  SEARCHLIM:INTEGER;
PRIME:ARRAY(1..3000)
  OF BOOLEAN;
FUNCTION SORT(NUMBER:INTEGER)
  INTEGER;
CONST
  INIT=4;
VAR
  RESULT,
  GUESS:INTEGER;
BEGIN
  RESULT:=INIT;
  GUESS:=0;
  WHILE ABS(GUESS-RESULT) > 1 DO
  BEGIN
    GUESS:=(RESULT+GUESS) DIV 2;
    RESULT:=NUMBER DIV GUESS;
  END;
  SORT:=GUESS;
END;
BEGIN
  WRITELN;
  WRITE("MAXIMUM NUMBER?");
  READ(MAX);
  WRITELN("PRIMES TO",MAX:6);
  WRITELN;
  HALFMAX:=MAX DIV 2;
  SEARCHLIM:=SORT(MAX)+1;
  INTERVAL:=3;
  PRIMPTR:=2;
  FOR N:=1 TO HALFMAX DO
    PRIME(N,):=TRUE;
  WHILE INTERVAL < SEARCHLIM DO
  BEGIN
    J:=INTERVAL+(INTERVAL+1) DIV 2;
    WHILE J <= HALFMAX DO
    BEGIN
      PRIME(J,):=FALSE;
      J:=J+INTERVAL;
    END;
    PRIMPTR:=PRIMPTR+1;
    WHILE PRIME(J,PRIMPTR)=FALSE DO
      PRIMPTR:=PRIMPTR+1;
    INTERVAL:=PRIMPTR*2-1;
  END;
  COUNT:=2;
  WRITE("1 2");
  FOR N:=2 TO HALFMAX DO
  BEGIN
    IF PRIME(N,):=TRUE THEN
    BEGIN
      WRITE(N*2-1:7);
      COUNT:=COUNT+1;
      IF COUNT MOD 10 =0 THEN
        WRITELN;
      END;
    END;
  END;
  WRITELN;
  WRITELN(COUNT:8, "PRIMES");
END;
```

| MAXIMUM NUMBER? PRIMES TO 50 |    |    |    |    |  |  |  |  |  |
|------------------------------|----|----|----|----|--|--|--|--|--|
| 7                            | 11 | 13 | 17 | 19 |  |  |  |  |  |
| 23                           | 29 | 31 | 37 | 41 |  |  |  |  |  |
| 43                           | 47 |    |    |    |  |  |  |  |  |

| 16 PRIMES |     |     |     |     |  |  |  |  |  |
|-----------|-----|-----|-----|-----|--|--|--|--|--|
| 7         | 11  | 13  | 17  | 19  |  |  |  |  |  |
| 23        | 29  | 31  | 37  | 41  |  |  |  |  |  |
| 43        | 47  | 53  | 59  | 61  |  |  |  |  |  |
| 67        | 71  | 73  | 79  | 83  |  |  |  |  |  |
| 89        | 97  | 101 | 103 | 107 |  |  |  |  |  |
| 109       | 113 | 127 | 131 | 137 |  |  |  |  |  |
| 139       | 149 | 151 | 157 | 163 |  |  |  |  |  |
| 167       | 173 | 179 | 181 | 191 |  |  |  |  |  |
| 193       | 197 | 199 | 211 | 223 |  |  |  |  |  |
| 227       | 229 | 233 | 239 | 241 |  |  |  |  |  |
| 251       | 257 | 263 | 269 | 271 |  |  |  |  |  |
| 277       | 281 | 283 | 293 | 307 |  |  |  |  |  |
| 311       | 313 | 317 | 331 | 337 |  |  |  |  |  |
| 347       | 349 | 353 | 359 | 367 |  |  |  |  |  |
| 373       | 379 | 383 | 389 | 397 |  |  |  |  |  |
| 401       | 409 | 419 | 421 | 431 |  |  |  |  |  |
| 433       | 439 | 443 | 449 | 457 |  |  |  |  |  |
| 461       | 463 | 467 | 479 | 487 |  |  |  |  |  |
| 491       | 499 | 503 | 509 | 521 |  |  |  |  |  |
| 523       | 541 | 547 | 557 | 563 |  |  |  |  |  |
| 569       | 571 | 577 | 587 | 593 |  |  |  |  |  |
| 599       | 601 | 607 | 613 | 617 |  |  |  |  |  |
| 619       | 631 | 641 | 643 | 647 |  |  |  |  |  |
| 653       | 659 | 661 | 673 | 677 |  |  |  |  |  |
| 683       | 691 | 701 | 709 | 719 |  |  |  |  |  |
| 727       | 733 | 739 | 743 | 751 |  |  |  |  |  |
| 757       | 761 | 769 | 773 | 787 |  |  |  |  |  |
| 797       | 809 | 811 | 821 | 823 |  |  |  |  |  |
| 827       | 829 | 839 | 853 | 857 |  |  |  |  |  |
| 859       | 863 | 877 | 881 | 883 |  |  |  |  |  |
| 887       | 907 | 911 | 919 | 929 |  |  |  |  |  |
| 937       | 941 | 947 | 953 | 967 |  |  |  |  |  |
| 971       | 977 | 983 | 991 | 997 |  |  |  |  |  |

| 169 PRIMES |     |     |     |     |  |  |  |  |  |
|------------|-----|-----|-----|-----|--|--|--|--|--|
| 7          | 11  | 13  | 17  | 19  |  |  |  |  |  |
| 23         | 29  | 31  | 37  | 41  |  |  |  |  |  |
| 43         | 47  | 53  | 59  | 61  |  |  |  |  |  |
| 67         | 71  | 73  | 79  | 83  |  |  |  |  |  |
| 89         | 97  | 101 | 103 | 107 |  |  |  |  |  |
| 109        | 113 | 127 | 131 | 137 |  |  |  |  |  |
| 139        | 149 | 151 | 157 | 163 |  |  |  |  |  |
| 167        | 173 | 179 | 181 | 191 |  |  |  |  |  |
| 193        | 197 | 199 | 211 | 223 |  |  |  |  |  |
| 227        | 229 | 233 | 239 | 241 |  |  |  |  |  |
| 251        | 257 | 263 | 269 | 271 |  |  |  |  |  |
| 277        | 281 | 283 | 293 | 307 |  |  |  |  |  |
| 311        | 313 | 317 | 331 | 337 |  |  |  |  |  |
| 347        | 349 | 353 | 359 | 367 |  |  |  |  |  |
| 373        | 379 | 383 | 389 | 397 |  |  |  |  |  |
| 401        | 409 | 419 | 421 | 431 |  |  |  |  |  |
| 433        | 439 | 443 | 449 | 457 |  |  |  |  |  |
| 461        | 463 | 467 | 479 | 487 |  |  |  |  |  |
| 491        | 499 | 503 | 509 | 521 |  |  |  |  |  |
| 523        | 541 | 547 | 557 | 563 |  |  |  |  |  |
| 569        | 571 | 577 | 587 | 593 |  |  |  |  |  |
| 599        | 601 | 607 | 613 | 617 |  |  |  |  |  |
| 619        | 631 | 641 | 643 | 647 |  |  |  |  |  |
| 653        | 659 | 661 | 673 | 677 |  |  |  |  |  |
| 683        | 691 | 701 | 709 | 719 |  |  |  |  |  |
| 727        | 733 | 739 | 743 | 751 |  |  |  |  |  |
| 757        | 761 | 769 | 773 | 787 |  |  |  |  |  |
| 797        | 809 | 811 | 821 | 823 |  |  |  |  |  |
| 827        | 829 | 839 | 853 | 857 |  |  |  |  |  |
| 859        | 863 | 877 | 881 | 883 |  |  |  |  |  |
| 887        | 907 | 911 | 919 | 929 |  |  |  |  |  |
| 937        | 941 | 947 | 953 | 967 |  |  |  |  |  |
| 971        | 977 | 983 | 991 | 997 |  |  |  |  |  |

and a pleasant one, was when one of the sample programs actually worked...I think.

Bear in mind that I am a bottom-of-the-ladder novice in Pascal. Bear also in mind that I have avoided higher mathematics like a plague for more years than I care to remember. Now, imagine my elation when I obtained both a compilation and an execution of a prime sieve program! Sure, I got it out of the back of the book, so what? I still had to translate it to Partial Pascal! Listing and Print-out are submitted with this review.

The "source code" compiled rapidly, once I got

it right. Sorry, I was too excited to time it exactly. Execution of the "object code" was timed fairly accurately. Primes to 1000 was done (on screen) in 30 seconds. Same operation to Timex 2040 printer took 4 seconds. Going for primes to 2000, I had it on screen (304 primes) in 55 seconds and I learned that I need a better understanding of proper formatting when I ported the same to the printer. OH well, back to the drawing board.

All jokes aside, PARTIAL PASCAL remains interesting, and FROM BASIC TO PASCAL is the best tutorial I have found to date. Thanks guys, I have enjoyed the experience. TSH

## REVIEWS for the Non-Programmer (TS 1000)

by Art Gindin

Expensive computers have a built-in procedure to check the system when starting, whereas we have only a "K". To remedy this situation I am supplying the following program. Don't panic, I did not write a program. The 16 K test is from the directions that come with the Sinclair RAM and the joke used to fill out the program is suitably referenced.

Notes on the program:

Line 1: SLOW is needed at the beginning of all programs loaded with ZXLR8.

Line 25: CLS removes the ZXLR8 message.

Line 110: If the 16K isn't all there, I suspect the program will crash anyway.

```
1 SLOW
10 REM <<<<>>OFFICE<<<<>>
20 REM <<<<>>INTRO<<<<>>
21 REM A. KOHLENBERG-SYNTAX 5/82
25 CLS
30 GOSUB 160
90 REM <<<<>>MEMORY TEST<<<<>>
100 REM <<<<>>16K TEST<<<<>>
101 POKE 19000,33
102 POKE 19001,11
103 POKE 19002,0
104 POKE 19003,57
105 POKE 19004,68
106 POKE 19005,77
107 POKE 19006,201
108 LET L=(USR(19000)-16373)/1024
109 PRINT L;"K"
110 IF L<15.9 THEN STOP
120 PAUSE 150
125 CLS
130 PRINT AT 4,1;"ENTER ""OFFICE"" AT THE PROMPT" 23
```

Line 130 and 140: These call up the ZXLR8 program to load the next part of the tape.

Some alterations would have to be made for a 64K RAM but I have never been able to get one to work on my system.

Something of more use is a zapper. This is a device to remove electrical spikes from your telephone line. I didn't think they were necessary either until we were struck by lightning and it took me a year to get my system back together. Zappers are available from Spaceport Products, Box 927, Sharpes, FL 32959 and were about \$11 each a year or so ago. Unless I were renting my telephone I would have one there too.

```
140 PRINT USR 14336
150 GOTO 0
160 PRINT AT 10,5;"*** HI, I AM ZWS1 ***"
165 PAUSE 100
170 PRINT AT 12,3;"I AM A PERSONAL COMPUTER"
180 PAUSE 150
190 PRINT AT 14,3;"I CAN DO MANY THINGS AND"
195 PRINT AT 15,7;"THE BEST IS ***"
200 PAUSE 150
210 CLS
220 PRINT ,;"I NEVE MAKE MISTAKES"
230 PAUSE 100
240 PRINT AT 2,7;"WHOOPS"
245 PAUSE 100
250 FOR Y=25 TO 7 STEP -1
260 PRINT AT 2,Y;"r"
270 PRINT AT 2,Y;" "
280 NEXT Y
290 PRINT AT 1,6;"r"
300 FOR A=18 TO 1 STEP -1
310 PRINT AT A,6;"R"
320 PRINT AT A,6;" "
330 NEXT A
340 PRINT AT 1,6;"R"
345 PAUSE 100
350 PRINT AT 10,8;"WELL, ALMOST NEVER"
360 PAUSE 150
370 CLS
380 RETURN
```



## 2068 REVIEW: GREETING CARD DESIGNER

Reviewed By Bill Ferrebee

MOUNTAINEER SOFTWARE

PROGRAM: GREETING CARD DESIGNER  
COMPUTER: TS2068 (80-col. printer required)  
PRICE: \$19.95  
AVAILABLE FROM: E. ARTHUR BROWN COMPANY  
3404 Pawnee Drive  
Alexandria, MN 56308

One of the most popular software programs to emerge in the past few years is PRINT SHOP. PRINT SHOP is a graphics program that lets you design banners, letterheads, and greeting cards with your computer and print them out with a dot-matrix printer. Almost everyone has received at least one greeting card or invitation produced with this program.

But, PRINT SHOP is only available for the so-called "real" computers... IBM, Apple, and Commodore. Does this mean that we TS 2068 owners have to do without again?

No! Thanks to Zebra Systems (the same great folks that brought us Tech-Draw... ZPRINT80... and many other fine products), we now have... GREETING CARD DESIGNER!

GREETING CARD DESIGNER works with any of the more popular TS2068 parallel printer interfaces (AERCO, Tasman, A & J), and any of the following dot-matrix printers...

Epson RX/FX  
Gemini 10X/SG10  
Memotech DMX80  
Panasonic 1090/1091  
Prowriter 8510

GREETING CARD DESIGNER comes with a 16-page manual, and a cassette tape with 2 programs on one side, and a library of 23 graphics on the other.

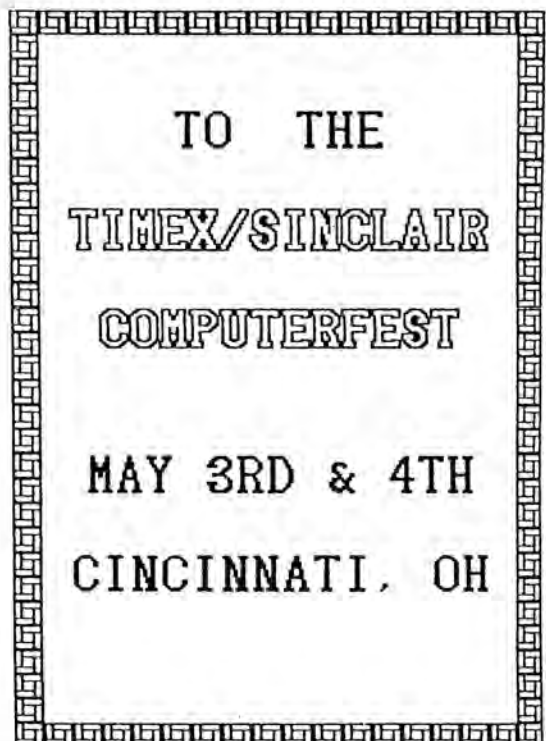
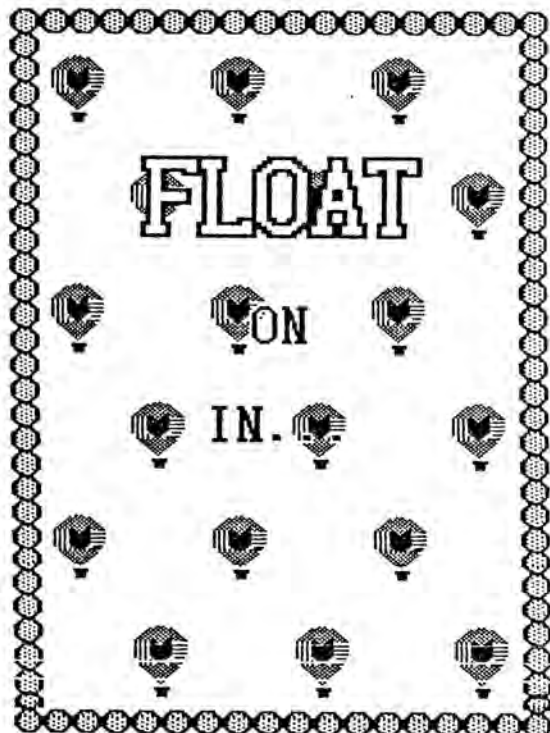
The two programs are the greeting card design program itself, and a graphic design program. This program enables you to design and save your own graphics for later use.

I found out how well the graphic design program works by necessity. The graphic library side of my review copy would not load (I tried 3 tape players!), so I had to design my own graphics.

Putting the program (and my lack of artistic ability) to this test proves how well this program is put together. I was printing my first card in minutes.

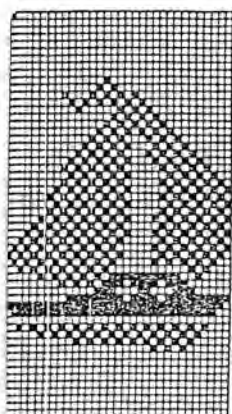
GREETING CARD DESIGNER gives you a variety of options to choose from. There is a menu of 8 different borders (you can use any 2 in one card), 2 type fonts and 2 type sizes. Also, using the graphic design program, you have an unlimited choice of designs. You are only limited by your imagination!

I believe in this program so much, I will be providing a new graphic for you to use in each issue of T-S HORIZONS. The first one is in this issue!



If you come up with a unique graphic, send it to me at:  
 Bill Ferrebee  
 MOUNTAINEER SOFTWARE  
 749 Hill Street #6  
 Parkersburg, WV 26104

In one word GREETING CARD DESIGNER is...  
 GREAT! I hope Zebra Systems has plans to  
 release programs for banners and letterheads,  
 so that we can have as much flexibility as  
 PRINT SHOP owners! TSH

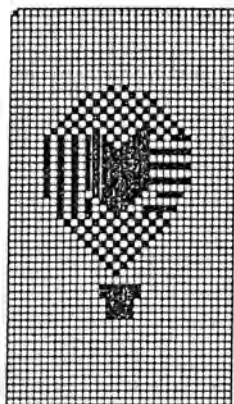


## GRAPHIC DESIGNER

sailboat



**Control Keys**  
 p=Plot o=Unplot  
 CS/s=Store graphic  
 CS/c=Clear graphic  
 CS/x=Exit  
 CS/p=Copy screen  
 Arrow keys to move  
 ENTER=Next line

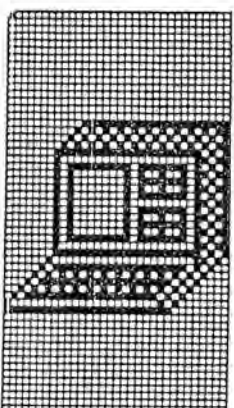


## GRAPHIC DESIGNER

balloon



**Control Keys**  
 p=Plot o=Unplot  
 CS/s=Store graphic  
 CS/c=Clear graphic  
 CS/x=Exit  
 CS/p=Copy screen  
 Arrow keys to move  
 ENTER=Next line



## GRAPHIC DESIGNER

computer



**Control Keys**  
 p=Plot o=Unplot  
 CS/s=Store graphic  
 CS/c=Clear graphic  
 CS/x=Exit  
 CS/p=Copy screen  
 Arrow keys to move  
 ENTER=Next line



SOFTWARE REVIEW  
by Tex Faucette  
BAND-AID TRUST  
c/o Stoy Hayward  
8 Baker St.  
London, Wi.

Reviews  
by



Available from CURRY COMPUTER, 5344 West  
Banff Lane, Glendale, Arizona 85306 (\$9.95)

I would assume that all readers are aware of  
the famine in Ethiopia, and of various  
cooperative efforts to provide relief to the  
victims.

The SOFTAID tape is one such cooperative  
effort, and provides a rather painless method  
for one to make a small contribution by way  
of its purchase.

The SOFTAID tape contains an audio segment  
at the beginning of each side (unplug the "ear"  
connector if you want to hear it), followed by  
five different game programs. Documentation  
with the SOFTAID tape includes an index count  
for each game and playing instructions. There  
is also a listing of numerous persons and  
companies involved in its production.

SPECTRUM ROM IS REQUIRED!

All of the 10 games included on the SOFTAID  
tape are excellent examples of British  
Spectrum programming. The graphics are  
imaginative, the action thrilling! All games  
may be executed by keyboard input only, but  
several contain menu selections for utilizing  
various joysticks and interfaces. Listen to  
me now, Vern, these are some of the  
top-rated games from across the Pond! Here's  
the lineup:

SPELLBOUND (Beyond)  
STARBIKE (The Edge)  
KOKOTONI WILF (Elite)  
THE PYRAMID (Fantasy)  
HORACE GOES SKI-ING (Melbourne  
House/Psion)  
GILLIGAN'S GOLD (Ocean)  
ANT ATTACK (Quicksilver)  
3D TANK DUEL (Real-Time)  
JACK AND THE BEANSTALK (Thor)  
SORCERY (Vigint)

Being somewhat less than a "Dedicated  
Gamerster" (a polite term for "arcade freak"),  
I hesitate to apply comparative ratings to

#### Advanced Video Modes

It's here at last, software that supports all the advanced display  
modes of the T/S 2068! By sacrificing just 1K of memory look  
what you get:

- normal, dual, extended colour, and 64 column modes
- compatibility with most printers including T/S 2040
- a UDQ replacement that's like sprites
- a full sized 12 page instruction manual
- new features can easily be added because the code is in RAM
- programs LISTable in any mode
- loads in only 15 seconds

All this for the low, low price of \$20.00 Can/\$15.00 US!



BEAVER COMPUTER PRODUCTS

999 MUNROE AVENUE, WINNIPEG, MANITOBA, R2K 1J4

'The best DAM software around'



games. I consider all of these ten to be  
excellent, but must confess to slight  
addiction to KOKOTONI WILF and JACK AND  
THE BEANSTALK.

At only a buck per game, this is an amazing  
bargain. It could become a "Collectors Item".  
All proceeds go to aid Ethiopian Relief.

BUY IT!

\*\*\*\*\*  
\$ THE \$  
\$ KRUNCHER \$  
\$ IS \$  
\$ !! HERE!! \$  
\$ \$  
\$ HAVE YOU EVER RUN INTO \$  
\$ THAT BRICK WALL CALLED \$  
\$ "OUT OF MEMORY"? \$  
\$ \$  
\$ HAVE WE GOT THE ANSWER FOR \$  
\$ YOU! A PROGRAM THAT WILL \$  
\$ "BYTE" INTO YOUR BASIC \$  
\$ PROGRAM, CHEW ON IT FOR A \$  
\$ FEW SECONDS, AND SPIT IT \$  
\$ BACK OUT WITH FROM 10 TO \$  
\$ 40% OF THE MEMORY EMPTY! \$  
\$ \$  
\$ SOUND GOOD! SURE IT DOES!! \$  
\$ WE HAVE TESTED IT, AND IN \$  
\$ ONE CASE, WE WENT FROM 239 \$  
\$ BYTES FREE, TO 12400 FREE! \$  
\$ \$  
\$ 2068/SPECTRUM - \$9.95+1 \$  
\$ 1000 VERSION COMING SOON! \$  
\$ \$  
\$ JUST CALL OR WRITE: \$  
\$ \$  
\$ RMG \$  
\$ ENTERPRISES \$  
\$ 1419 1/2 7TH STREET \$  
\$ OREGON CITY, OR 97045 \$  
\$ (503) 655-7484 \$  
\$ S.A.S.E. \$  
\$ FOR FREE CATALOG \$  
\$ SEND THIS AD OR COPY WITH \$  
\$ ORDER-GET COUPON GOOD FOR \$  
\$ \$5 OFF NEXT ORDER FOR \$25 \$  
\$ OR MORE! \$  
\$ \*\*\*\*\*



TS 2068 REVIEW  
The "HORACE" Saga....

There are 3 programs in the Horace saga: HORACE AND THE SPIDERS, HORACE GOES SKIING, and HUNGRY HORACE. Having all three, I think they are quite entertaining.

First let me tell you about Horace. He looks like a little ghost and he is easy to get hooked on because he is so cute. Even the cassette covers will make you chuckle.

HORACE AND THE SPIDERS is a game in which you have to guide Horace through 3 scenarios. You can either use the joystick or the keyboard. You must keep Horace away from those spiders because he has only 5 lives!

The first scenario is just one where you have to jump over the spiders at the right time. The second one is a little harder!

In the second scenario, you must get Horace across a pit. But you must jump onto the rope that each spider holds onto. When you are on the rope, the spider will then start pulling it up so you must be quick.

The third scenario is like Space Panic (or Apple Panic). You must make holes in the web so the spiders get stuck in them. Then you have to jump up and down on one until he falls through and dies.

HORACE GOES SKIING is another good game. In this one, Horace must cross a road with heavy traffic in order to rent his skis. Then he must cross back again. Some of those drivers are maniacs!!!

Once across, Horace can start skiing. He must ski between five flags (it's a slalom course) to get points. There are trees in the course which you must avoid. If you hit a tree three times with the same pair of skis, you break them and you must go back across the street for another pair.

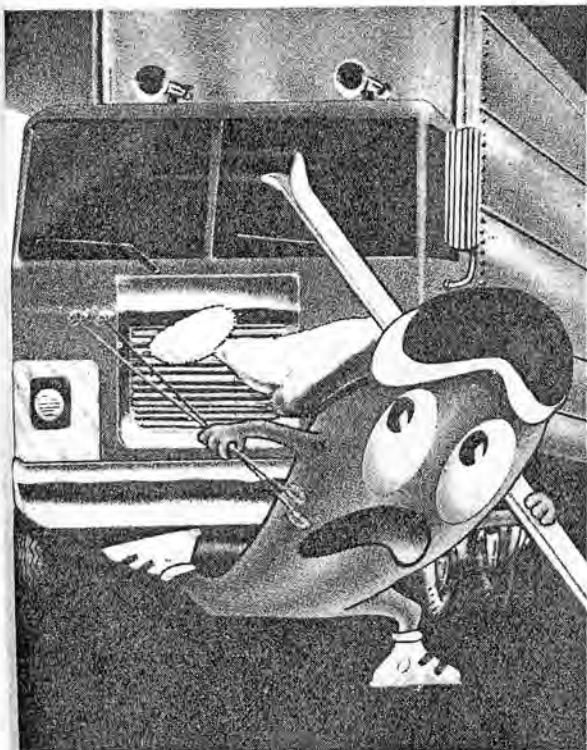
Horace has \$40 in the game. It costs him \$10 to rent skis each time and \$10 for the ambulance fee (if he is hit by a car).

And finally, HUNGRY HORACE is another PAC-MAN type game. It is much harder though. In each maze there is an exit where Horace can exit into another maze (3 in all). It is a fun game.

In all three Horace games you can use a joystick. My favorite is probably HORACE GOES SKIING.

Doug Gangi

Editor's Note: All three programs are available from "Games To Learn By", P.O. Box 78, 28 Clairhill Road, Collinsville, CT 06022 (203) 673-7089. TSH



---

The "Horace Trilogy": Hungry Horace, Horace and the Spiders, and Horace Goes Skiing.

---

## QuarTerS

A quarterly publication for the Timex/Sinclair computer user.

"...Every issue has been full of helpful articles, great software reviews and new product information. Thanks for publishing a needed magazine for TS computer owners and for keeping it easy to read and understand. I have read other TS computer magazines, but none have been as helpful to me as QuarTerS...I'm really glad I subscribed to QuarTerS..."-C. Bower

One year subs. only \$8.00. Overseas only \$11.00(US\$). Check or MO to: WMJ DATA SYSTEMS, 4 Butterfly Dr, Hauppauge, NY 11788.

### FREE FIRST ISSUE

TSH

Send this coupon to WMJ Data Systems, 4 Butterfly Drive, Hauppauge, NY 11788. You will receive one free issue of QTS and we will bill you for a one year subscription. If you do not want to subscribe write cancel on the bill and keep your free issue.

NAME \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY \_\_\_\_\_  
STATE \_\_\_\_\_ ZIP \_\_\_\_\_

The Following TS 2068 Software  
is Available from H.C.S. Software  
P.O. Box 1754, Ports., OH 45662

*Horace & the Spiders*

*Fun Golf*

*Crossfire*

*Personal Portfolio Manager*

*Home Improvement Planner*

*Language Usage*

*Math Wizardry 1*

*Math Wizardry 2*

*Checkbook Manager*

*Budgeter*

Plus with any order you get free  
*States & Capitals*

LIMITED QUANTITIES OF SOME TITLES

PLEASE INDICATE SECOND  
AND THIRD CHOICES

\$ 2.50 each. Add \$1.00  
per order shipping.

ORDER NOW!  
SATISFACTION GUARANTEED!

## K A M R E C   S Y S T E M S

27366 BLUM  
ROSEVILLE, MI 48066

NEW!!! Announcing CROCKET; A fully integrated accounting system for the Q/L. This masterpiece consists of Payroll, Inventory, Accounts Payable, Accounts Receivable, and General Ledger sub-systems. This is what you've been waiting for to manage your small or large business and/or your household finances. The estimated availability date is March 31, 1986. We have been accepting advance orders at the "early-order" price and will continue until April 30, 1986.

"Early-Order": \$ 69.95      After April 30: \$ 79.95

All orders please include \$ 3.00 shipping.

T-S NEWS

ITEM: "Zebra Systems, Inc. announced that the price on their Zebra-Talker has been reduced and the software is compatible with their disk drive. My notes say \$35.00, hope I got it right. They are now ready to market C/PM for the disk drive system. They will have WORDSTAR and Microsoft BASIC available. They currently have M-SCRIPT and UTILITY PGMS available on disk for the built-in T-DOS system. Both Letterwriter/Bufferwriter and M-Script are available on tape for use with OS-64. For anyone who has their Greeting Card designer program they have announced that they are going to be releasing data tapes with many cut-and-paste designs. If you submit (on tape) a design that they can use you will receive the tape that yours is on." (From Mile High Chapter TSUG newsletter, 914 S. Victor Way, Aurora CO 80012)

## Classified Ads

INDIANA TS/ZX USERS; Let's start a users group. Write to Frank Davis, 513 E. Main St., Peru, IN 46970. Open to beginners as well as pros. ZX80, ZX81, TS 1000, TS 1500, Spectrum, and TS 2068 users.

Aerco FD-68 w/b - 150. Aerco C/P IF w/s - 50.  
Timex 2068 (no RGB) - 50. Timex 1000-20.  
TS 2050 w/MTII - 50. All + S/H. (M/O only). D.  
Gustafson, Old Corry #1501, Pens., FL 32507.

FOR SALE: Portuguese 2068. Never used. Make offer. H.C.S. POBox 1754, Portsmouth, OH 45662.

ITEM: A new book of over 200 hundred programs for Timex and Sinclair computers. That's right! The author is Joe C. Smith, jr., a current writer for Computer Trader Magazine, and soon to be a writer for TS Horizons. The cost of the book is just \$7.95 (plus \$1.50 P&H) and contains all kinds of programs from a Word Processor, to an NFL Prediction program. Other programs include "Sundial", "Couponing", "Supergraph," and much more. Order from BIT/S Software, 3202 W. Fillmore, Phoenix AZ 85009. Plus free mechanical drafting pencil while supplies last.

ITEM: Howard Sams Co., 4300 W. 62nd St., Indianapolis IN 46268, has just published a new reference book for TS 1000/ ZX81 maintenance and repair. It is part of their series of "Computerfacts" manuals that cover a wide range of microcomputers. The cost is \$19.95. Call 1-800-428-SAMS for more information.

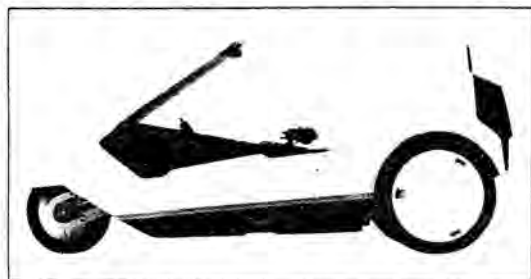
ITEM: The Timex 2068 Technical Manual is now available in its second edition. The book is said to contain many improvements over the original poorly produced version including spiral binding, professionally printed text, and a full color cover. Over 300 Pages. \$25 postpaid from Time Designs, 29722 Hult Rd, Colton, OR 97017. Tell'em TS Horizons sent you.

ATTENTION: 2068 owners. If you don't have a ZX/81 or TS 1000. Then you probably didn't read Pete McMullin's news about the Westridge 2050 Modems (without power supply or cases, but with phone cables) for only \$25 each from Dave Cliford, 13910 Halldale Av., Gardena CA 90249.

And if you didn't read that, you probably didn't read about Weymll Corp's MINI-XMOD modem software for the 2068 and the ZX81. Only \$20. Maybe now's the time to get into telecommunications. See Peter's article, "ZX81 News and Resources."

C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5C5

**ITEM:** The Sinclair C-5 electric vehicle is now available for sale in the United States. Newpower, Inc., 64 Foundry St., Keene, NH 03431 is the exclusive U.S. importer. The price is \$595 assembled or \$395 in kit form (plus \$95 shipping). The Sinclair C-5 is battery-powered, inexpensive to operate, and cruises at up to 15 mph. You can order by calling



1-800-543-8000, operator 863. You can return it in ten days if not satisfied (you still pay shipping charge.)

|                          |                |
|--------------------------|----------------|
| Length                   | 5'9"           |
| Width                    | 2'5"           |
| Height                   | 2'7"           |
| Weight (without battery) | 66 lbs.        |
| Luggage capacity         | 1 cu ft        |
| Max. speed               | 15 mph         |
| Tires                    | pneumatic      |
| Range                    | Up to 15 miles |





ITEM: "Thomas Woods has developed a 32K Bank-Switched programmable Memory cartridge for the TS 2068. It is battery-protected to retain its programs when the computer is switched off. A write-protect switch lets you use memory like an EPROM. Therefore you can run your own plug in programs, or extend your memory by 32 K. With detailed instructions for bank switching and data transfers. \$110.00. Inquire to T. B. Woods, P.O. Box 64, Jefferson NH 03583. 603-586-7734." (From RAMTOP, Cleveland TS Newsletter,.)

## COMPUTER TERMS

The following computer terms appeared in ZX Computing (Feb/Mar '85, page 40). The author is Jim Lock of Surry, Great Britain. Larry Chavarie sent a copy of the list to TS Horizons and we picked out our favorites.

**Array** - what you shout when your program works first time.

**Artificial Intelligence** - what you think your com-puter has and it thinks you have.

**BASIC** - a standard language most suitable for newcomers to computing as it uses simple words and instructions such as ABS, OPEN \*, LPRINT, USR, DEF FN and CHR\$.

**Computer tape** - used to attach a Sinclair RAMpack to a ZX81.

**Cursor key** - what you often do when you accidentally move your laser base in the wrong direction.

**DIM** - how you feel when you see programs written by you seven year old daughter.

**FOR...NEXT** - short extract from conjuror's patter, "For my Next trick".

**IF...THEN** - conditional statement, as in "IF you try to copy this program THEN your computer will explode."

**LEN and VAL** - the married couple who live around the corner.

**Listing** - what your computer is doing to one side, having lost one of it's rubber feet.

**Microdrive** - car-racing arcade game for your computer.

**NOT** - used to tie two STRINGS together.

**RAMpack** - device you plug in to the back of your computer so that it can unplug itself whilst you are typing in the last line of a very long program.

**REM** - put at the beginning of a line to REMind you to remember it and the computer ignore it.

**Screwdriver** - instrument for invalidating guarantees.

**Sound chip** - good golf shot.

**STRING** - used to attach a Sinclair RAMpack to a ZX81.

**Uncopiable cassette** - blank cassette. TSH

## SHARP'S INC.

Rt 10 Box 459

Mechanicsville, Va. 23111

(804) 746-1664 9am to 5 pm

(804) 730-9697 5pm to 11pm

## SOFTWARE FOR T/S 2068:

|                       |       |         |
|-----------------------|-------|---------|
| WAR IN THE EAST       | EACH  | \$19.95 |
| FALL OF THE 3rd REICH | 2 FOR | 34.90   |
| ARDENNES              | 3 FOR | 49.85   |
| BRITAIN INVADED!      |       |         |
| FALL OF ROME          |       |         |
| REDCOATS              |       |         |

These are military strategic wargames. Write or call for more information.

QL COMPUTER \$289.00 Includes shipping  
Software & Hardware available for QL.  
Write for catalog.

VISA & MASTER CARD accepted

|                       |       |
|-----------------------|-------|
| AFR                   | 2     |
| Beaver Computer Prod. | 26    |
| Budget Robotics       | 19    |
| Byte Back             | 31    |
| Chia-Chi Chao         | 17    |
| CTM                   | 14    |
| Curry Computer        | 21    |
| Gulf Micro            | 12    |
| Haltronics            | 15    |
| HCS                   | 20,28 |
| Larken                | 15    |
| RMG Enterprises       | 26    |
| Sharp's               | 30    |
| Simulslon             | 15    |
| Softgems              | 9     |
| SUM                   | 20    |
| Time Designs          | 20    |
| Weymll                | 32    |

# TS 2068 DISC SYSTEM

## FD-68 INTERFACE

Controls 1-4 drives

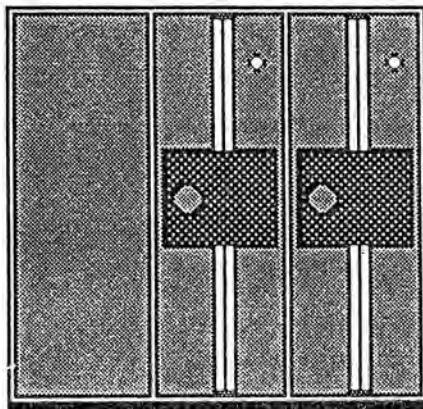
3 inch to 8 inch drives  
Shugart compatible

Single or double sided

40/80 tracks per side

64K RAM (256K opt.)  
& 8K ROM on board

RGB monitor output



## SYSTEM COMPONENTS

\$199 FD-68 Interface

\$99 Drive 40T/DS/DD  
5 inch/400 kilobyte

\$99 Dual Drive Cabinet  
and 5 amp Pwr Pack

\$3 Per Item S&H

Texas Residents add 6%

VISA/MasterCard add 5%

Enhance the performance of your TS 2068 with the **AERCO** Disc System. All of the speed and convenience of a full-out floppy disc system. Save, load and copy programs at the industry standard of 250,000 bits/sec. Fully compatible with all Shugart type drives, including those already in use with the **AERCO** 1000 Disc System. The 64K of on-board RAM can be used as a second bank of system memory or for a full-blown CP/M System (version 2.2). The RGB output is crystal clear and rock steady. The power supply is a 5-amp high efficiency switcher. We offer a variety of other hardware for all models of sinclair-TIMEX.

NOW AVAILABLE: 256K UPGRADE \$50 (2-drive max) \$80 (4-drive max)

|                                   | <u>TS/2068</u> | <u>TS/1000-1500</u> |
|-----------------------------------|----------------|---------------------|
| Floppy Disc Interface .....       | \$199          | \$179               |
| Disc Drives .....                 | from 79        | from 79             |
| Power Supplies .....              | 99             | 99                  |
| Centronics Printer I/O .....      | 69             | 99                  |
| Dual RS-232C Serial I/O .....     | 99             | 99                  |
| C ITOH 8510 Printer .....         | 375            | 375                 |
| C ITOH 7500 Printer .....         | 275            | 275                 |
| ROM Bd. with Auto Disc Boot ..... | n/a            | 59                  |
| RGB Cable (specify monitor) ..... | 30             | n/a                 |
| CP/M (V. 2.2) .....               | 25             | n/a                 |

**AERCO**  
ACME ELECTRIC ROBOT CO

Box 18093 Austin TX 78760  
Ph (512) 451-5874

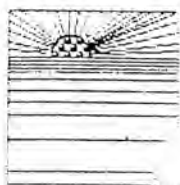
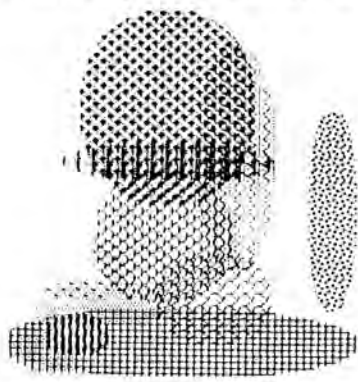
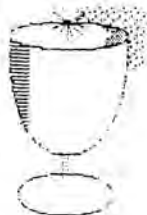
...makes a serious commitment to the Timex user in the development of high-quality, innovative, and user-friendly software, complete with layman-oriented documentation, and all at affordable prices. We are proud to offer you:

**\* THRUST \***

Finally, real graphics power for your TS 1000! THRUST, the last word in cursor-controlled hi-res graphics for screen or printer output, is a software package composed of SincArtist HR and SincArtist 1.3. Examine this sample for an idea of the powerful versatility of THRUST.

SINCARTIST 1.3 - The original! Fantastic hi-res graphics delivered to the 2040 printer. SincArtist 1.3 boasts excellent user-group reviews and is simply the best non-hardware system available. Note these features:

- 192 X 256 high-resolution file displayed in a 48 X 64 screen window
- Circles, triangles, rectangles, quadrilaterals, rays, inversing, and more
- 40 redefinable patterns and a variety of draw and fill modes
- Cursor or joystick control
- No system modifications required



SINCARTIST HR - The last word in cursor-controlled high-resolution screen graphics. Copy artwork to the 2040 printer and save to tape. SincArtist HR requires a TS 1000 with a socketed 2K RAM, less than \$10.00 in parts, and a few minutes with a soldering iron. Super user-friendly documentation and instructions included. All modifications are fully transparent to other peripherals. HUNTER BOARD OWNERS: All you need is the FREE hardware upgrade that we provide!!!!

THRUST includes SincArtist HR and Sinc-Artist 1.3 (these programs are not sold separately). The Ultimate Hi-Res Tape is available exclusively from Weymil Corporation for only \$20.

**\* MINI XMOD \***

MINI XMOD - Allows your Westridge or Byte-Back modem to up and download Timex programs to any XModem protocol BBS.

- Fully documented with easy-to-follow instructions for the layman
- 16K and 64K versions included
- Ideal for storage in Hunter Board
- Produced on high-quality cassette for the ZX 81, TS 1000, and TS 1500

MINI XMOD is available from Weymil Corporation for only \$20. Please specify Westridge or Byte-Back version.

WEYMIL CORPORATION  
BOX 5904  
BELLINGHAM WA  
98227-5904

(Write for a free catalogue of other TS 2068 and TS 1000 products)